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1920-Thirty Years of Service to Construction-1950

Contractors and Engineers Monthly

Vol. 47, No. 5

MAY, 1950

\$3 a Year, 50 Cents a Copy



• Terminal and Stadium

Bubbling ground water failed to halt excavation for the Des Moines Airport terminal building. See this page.

There's an interesting concrete-placing story on page 62—construction of a football stadium using steel pan forms.

• Highway Grading

House moving, clearing, grubbing, draining, dirt-moving, topsoiling—done with dispatch, as page 1 relates.

• Soil Conservation

Page 5 outlines present soil and drainage work under way at the head of the mighty Missouri River.

• Paving—Bridge and Road

Simple forms, pump-line concrete, and power buggies speeded deck pours on the Mystic River Bridge. Story on page 17.

Grading and drainage were part of a 4½-mile by-pass paving job in Michigan—page 37.

• Levee Along Lake

Jefferson Parish, La., has new levee flood protection (page 23). Draglines built dikes, dredges pumped hydraulic fill.

• Bituminous Paving

Forty-four miles of low-cost asphalt work has opened a short cut through Wyoming's famed South Pass—page 28. State forces used local aggregate and two asphalt-plant driers on 21 miles of sand-asphalt black-top repaving (page 75).

• County Engineers Speak Up

A questionnaire prompted and page 35 quotes some interesting opinions about salaries, training, and duties of county engineers.

• Pump Installation at Plant

Careful rigging and lifting were called for during pump installation at the Tracy Pumping Plant. A full account and pix on page 42.

• Roadside Development

"The complete highway" was the theme of the Ninth Annual Short Course on Roadside Development—see page 47.

• Power for Australia

Page 54 describes Australia's biggest power project, which will include 7 dams, 16 power stations, 84 miles of tunnel.

• Bridges and Causeway

Steel foundation piles support three new bridges over the Mississippi (page 57). The million-dollar causeway contract covered on page 86 included two bridges and hydraulic roadway fill.

• Form Work for Dam

A new type of cantilever steel form eliminates tiebacks and reduces anchors at Bull Shoals Dam. See page 69.

• Highway Department Garage

One of the most modern highway-shop layouts in the country is described and pictured on page 82 of this issue.

• Eight Miles of Water Line

Who says pipe laying can't be mechanized? Here's a contract, page 95, which says it can be, in the heart of a city, too. (You will find "In This Issue" on page 4)

Airport Terminal Gets New Building

New Administration Building At Des Moines, Iowa, Airport Provides Convenience Plus Beauty for Patrons

AIR travelers to and from Des Moines, Iowa, will soon pass through a modern new \$600,000 terminal administration building. The structure is now under construction for the City of Des Moines by Garmer & Stiles Co., contractor of that city. It is expected that the firm will have the building ready for use before the 400 working-day time limit, from June 8, 1949, is reached.

Ground water, underground springs, a labor strike, and a few other such unpleasant things combined to throw some difficulties in the way of the builders, but these problems were solved. The men went back to work, the springs were dried up by pumps, and a run of good weather permitted work to proceed rapidly. Less than 60 days after the project was started, structural steel was already rising above the ground.

Designed by William N. Nielsen, Architectural Engineer, the new terminal building is expected to serve Des Moines air passengers for years to come. It will be 261 feet 6 inches long and 81 feet 7 inches wide. The building will have a boiler room, basement, two main floors, and a control tower. The outside of the structure will be finished in brick, metal facing, and stone coping. The floors will be either concrete, (Continued on page 100)



C. & E. M. Photo

A Euclid loader pulled by an Allis-Chalmers HD-19 tractor loads a bottom-dump Euclid with field topsoil on the Aiken, S.C., highway grading job reported on this page.

Dual-Lane Road Is Graded at Fast Pace

Dirt Moved on 10.8-Mile Job At a Rate of 100,000 Yards A Week for Two-Month Period On U. S. 1, South Carolina

THE biggest highway project in South Carolina last season involved the relocation of 10.8 miles of U. S. 1 between Aiken and Hamburg. (Hamburg is just across the Savannah River from Augusta, Ga.) The new construction is a dual-lane highway with two 24-foot pavements separated by a median strip. It is located about ½ mile north of the original highway, and north also of the main line of the Southern Railway. The old highway, a 20-foot concrete pavement, was laid

back in 1929. Though still in fairly good shape, it has long been too narrow to carry satisfactorily the heavy traffic between Aiken and Augusta.

On this short 16-mile stretch there are seven busy mill towns that contribute to the congestion on the old highway. These towns are by-passed with the new highway alignment, which for the most part follows the historic line of the old Charleston & Hamburg Railroad, one of the very first railroad lines constructed in the country. At each end of the new highway, where a junction is made with the existing pavement, there are approximately 3-mile sections that were not included in the recent improvement. Consequently the new dual-lane construction stops short of the two large cities just beyond the ends of the project.

Construction got under way on November 22, 1948, after the South Carolina State Highway Department awarded a contract for grading and drainage structures to the two firms of

(Continued on page 10)

CONCRETE WORK AT BULL SHOALS DAM, ARKANSAS



A new type of cantilever steel form is eliminating tiebacks and reducing anchors for concrete pours at Bull Shoals Dam. See page 69.

NEWS AND VIEWS

of the construction industry at home and abroad—trends,
volume, Federal Aid, people

This month **Mexico** inaugurates her new north-to-south highway from El Paso, Texas, to Guatemala—2,176 miles. Opening of the Juarez-El Ocotl Highway means that she no longer has a single road, called the Pan American Highway, but five gateway routes from the north to her capital, and from there a single road to the Guatemalan frontier. She maintains her principal roads better than we do most of ours, John Harrison of the BPR says. In a recent trip down there, he saw only one small pothole in a road surface, and he experienced not a bump riding over sections that had been repaired or pulled over onto road shoulders . . . **India** (did you know she has no more than 1/5 mile of road per square mile of area?) will send a small group of road engineers to the 16-week BPR highway course which starts this month . . . **England** hopes to spend about £600 million to improve her motorways and city streets in the next 10 years . . . **Brazil** is preparing for her Highway Congress and Road Show to be held at Rio next November . . . Next December comes the Fifth Pan American Highway Congress at Lima, **Peru** . . . And next year in Lisbon, **Spain**—barring H-bombs and you-know-what—comes an International Road Congress. For news of **Australia's** power-irrigation project, see page 54.

Back home, Uncle Sam has a heavy slate of public works. Congress has authorized some \$25 billion worth of projects, excluding military works, to be built whenever money is made available. The Army Engineers program can account for \$9 billion and Reclamation for about \$5.5 billion. The F-A highway bill and the omnibus flood-control, river, and harbor bill on Congress' agenda may up the total by \$2.5 to \$4 billion.

As this is written, the House Public Works Committee has approved an amended version of the **Whittington Bill**, providing \$670 million Federal Aid per year for fiscal years 1952 and '53. It carries initial authorizations of \$225 million for the primary system; \$150 million for secondary roads; \$125 million for urban; \$70 million for the Interstate System. Witnesses at hearings called for annual Federal Aid ranging from \$570 million to \$1 billion. Commissioner **MacDonald** asked that the total authorization be held to \$500 million, but that the \$70 million for the Interstate System be swelled to \$150 million. He favored a 50-50 state matching basis rather than the



John F. Casey Co. excavates for the foundation of Pittsburgh's newest 41-story skyscraper, 525 William Penn Place Building. Two Lorain Moto-Cranes and a Lorain crawler crane are shown at work in the 120 x 130 x 90-foot deep foundation hole.

75-25 permitted by the Whittington Bill . . . But **Charlie Upham** for the ARBA would double the total figure, with \$259 million a year for the Interstate. At a rate of \$70 million a year, he said, "it would require 121 years to bring the system up to today's requirements," let alone tomorrow's. He approved the 75-25 ratio . . . Connecticut's **Ray Jorgensen** asked that apportionment of Interstate funds be based not on state population but on cost of needed improvements. AGC Director **H. E. Foreman** told the committee that road contractors could expand to handle a volume of work twice that of 1949 if a long-range national policy were established.

Most interesting riddle of the month: **when is a toll road not a toll road?** Will Governor Dewey's New York-to-Buffalo throughway be a toll road because special user license fees will finance it? And what of plans to use some Federal money to build it, when Congress insists that F-A shall not be used for toll roads?

Maybe you'd be interested in this news footnote which reached us recently. At a mock high-school election in Connecticut, complete with speeches, placards, and handshaking, students balloted furiously over a throughway truck route in their state to relieve congestion on main arteries. The need for the highway was assumed, only its location was debated. This reminds us of some remarks by New Jersey's Spencer Miller, Jr., at the Ninth Annual Short Course on Roadside Development (see page 47). If ever we are to get rid of our roadside slums, he said, and develop "the complete highway", **we cannot afford to overlook the voluntary cooperation and support of the public.** Citizen participation—even a mock high-school election, we submit—is the heart of the democratic process.



New Jersey Turnpike Authority Photo
Paul L. Troast, Chairman, New Jersey Turnpike Authority, and William J. Brewster, President, George M. Brewster & Son, Inc., contractor, watch the start of grading for the Turnpike. The 176-mile toll road is scheduled for completion late in 1951.



Bureau of Reclamation Photo
One last look at winter, before it loosened its grip on northwestern Montana and the 139-foot-high concrete-mixing plant at Hungry Horse Dam. Large scale hiring began again last month when major concrete placing was scheduled to resume.

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An Improved Method For Soil Shear Test

A new method for in-place determination of soil shear has been tested by E. Vey and L. Schlesinger of the Illinois Institute of Technology, Chicago, Ill. It was described at the 29th Annual Meeting of the Highway Research Board. The new method, which uses rotating blades, is designed to provide accurate in-place measurements and to eliminate costly time-consuming laboratory methods.

Equipment employed in the method consists of a 4-faced blade fixed to a shaft which is turned at a constant rate in the soil. By relating the distribution of soil resistance on the surface of the blade to the measured surface force, the soil strength is determined.

Heretofore, soil strength has been measured by removing samples from the ground and testing them in the laboratory. Schlesinger and Vey consider these tests incomplete because of the temporary removal of pressure from the sides and consequent destruction of the original soil structure. The in-place measurement permits a determination of the true strength, they feel. They point out that by making spot measurements quickly available at any level, risks, costs, and delays in construction can be reduced.

Highway-Capacity Manual

A knowledge of highway capacity is essential to the design of new highways and the adaptation of existing streets and roads to present or future traffic volumes. In a detailed report called "Highway Capacity Manual", compiled by the Highway Research Board Committee on Highway Capacity in cooperation with the Bureau of Public Roads, the elements of highway design, vehicle and driver performance, and traffic control which tend to reduce highway capacities are thoroughly discussed and corrective measures are indicated. Data are included on the capacities of rural two-lane and multi-lane highways, the flow of traffic at intersections at grade, weaving sections, grade separations and ramps, the effects of parking on city streets, and the relation of hourly to annual average traffic volumes.

The study is based upon the results of surveys and research conducted by the Highway Research Board, the Bureau of Public Roads, and a large number of state, county, and city highway and traffic engineers over a period of years. It was prepared by O. K. Normann and W. P. Walker of the Highway Transport Branch of Public Roads.

The report was originally published in recent issues of *Public Roads*. Copies in booklet form can be obtained from the Office of the Superintendent of Documents, Washington, D. C., for 65 cents.

Landscaping Lectures

To interest students of highway engineering in landscape design and roadside protection, the New Jersey Roadside Council, in cooperation with Rutgers University College of Engineering, inaugurated this spring the Spencer Miller, Jr., Lecture Series. The title of the series pays tribute to the contribution of State Highway Commissioner Miller to roadside improvement in the New Jersey state highway system.

J. Rivington Pyne, former Senator of Somerset County, and Chairman of the Board of the New Jersey Roadside Council, said that the lectures were designed to give civil-engineering students an introduction to many problems which are involved in the design of a complete highway facility combining utility, safety, and attractiveness. It is hoped that this introduction will help point the way to a greater cooperation between the civil engineer and the

landscape architect, and result in future highways of improved design and construction.

Gilmore D. Clarke, New York engineer, an authority on parking design, gave the first address. Oliver A. Deakin, Parkway Engineer, New Jersey State Highway Department, spoke on March 6 and April 3. And Hugh R. Pomeroy, lecturer in planning at Columbia University and author of the first county zoning ordinance in the U. S., gave the May 5 lecture.

ASTM Committee Meetings

Committee C-9 on Concrete and Concrete Aggregates and Committee D-4 on Road and Paving Materials met during Committee Week of the American Society for Testing Materials, which took place during March in Pittsburgh.

Among recommendations presented by Committee C-9 was a change in the standard method of sampling fresh concrete to reconcile the procedures on

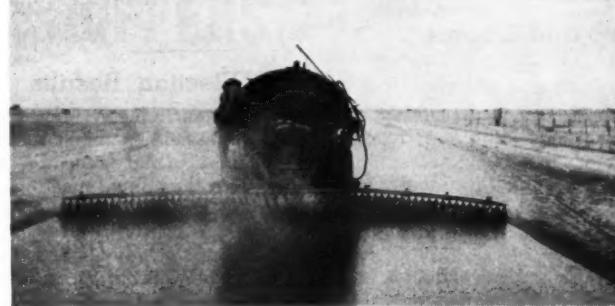
flow and slump, and a consolidation of all air-entraining test methods under one designation. The committee also decided to include limits in the standard specifications for concrete aggregates for flat and elongated pieces.

Committee D-4 proposed a method for determining the bitumen in paving mixtures using the Rotarex method, and suggested a revision of the standard specifications for asphalt plank to substitute a hardness test in place of an indentation test.

Road-building with Texaco in



Laying 4 inches of Texaco Asphaltic Concrete Paving, containing low-cost local aggregate, on State Highway 29 in Texas.



Applying a hot seal coat of 175-penetration Texaco Asphalt to the asphaltic concrete surface.



Crushed gravel, heated to 375° F., is spread and rolled into the asphalt seal coat.



Completed Texaco Asphalt pavement on 12 miles of Texas Route 29, constructed by J. M. Dellinger, Inc. of Corpus Christi.

aggregate-poor areas

Along the Gulf Coast of Texas, the only local aggregate for highways is caliche, a relatively soft material, and sand. How these low-cost materials were used to construct 12 miles of state highway will interest road builders in other aggregate-poor areas.

For a sub-base, caliche was laid to a compacted thickness of 7 inches. Over this was constructed 4 inches of Texaco Asphaltic Concrete—caliche and sand plant-mixed with a 90-penetration asphalt. To compensate for the soft caliche, a seal coat of 175-penetration Texaco Asphalt was applied and covered with heated, crushed gravel, the only imported aggregate used.

The caliche sub-base was primed with Texaco MC-1 Cutback Asphalt. Tack coats of Texaco RC-2 Cutback Asphalt were applied between the three or four layers of asphaltic concrete.

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TEXACO ASPHALT



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William H. Quirk
Eastern Editor

Michael A. Spronck, Catherine J. Hearn, Pauline E. Putnam
Associate Editors

Raymond P. Day
Western Editor

Edgar J. Buttenheim, President
George S. Conover, Vice President
Edwin Wagner, Secretary and Treasurer
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Donald V. Buttenheim, Publisher
Myron MacLeod, Advertising Manager
Albert T. Miller, Pacific Coast Manager
Edgar M. Buttenheim, Asst. Advertising Manager

Hannah Duke Henn, Circulation Manager

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Building Research is Here

We take this editorial opportunity to greet BRAB (Building Research Advisory Board), and wish it success in its purpose—"the correlation and stimulation of building research". This new unit of the Division of Engineering and Industrial Research of the National Research Council is just getting started in the building industry, and deserves a hand for the benefits which it, in time, will be disseminating. For BRAB proposes to do for building construction what the Highway Research Board is doing for highway building.

Already in January of this year BRAB sparked a successful research council on the subject "Weather and the Building Industry", in which the effect of climate on building design, construction, materials, and equipment was discussed. Representatives of building technology met with scientific authorities on weather and climate, and came away richer from the exchange of ideas, and broader in outlook with the satisfaction gained from furthering cooperation in such research.

BRAB itself will neither have laboratories nor carry on research. It aims to promote and integrate research useful to building construction by other research agencies. Conferences and forums, like the one on weather, will be held. What has already been done in the field of building research will be analyzed and classified. Surveys will be taken to determine problems in the building industry that might be solved by research. All the information acquired will then be made available through a program of publication.

This is a large order for any organization, and BRAB is very new and very small as yet. It is still in the stage where it must sell itself to the building industry. BRAB is an independent agency working on funds contributed by the industry, but it may get some government money from contracts for advisory services to governmental agencies. The Associated General Contractors of America has helped BRAB financially, and individual building contractors can assist by suggesting subjects on which research would be beneficial; by actually taking part in the research in such fields as methods of construction, man-hour savings, and material handling; and by testing the results obtained.

Practically, BRAB's objective may be stated as directed to obtaining building for less money, or better building for the same money. For research should develop ways to do things better, or to reduce costs and thus create new or broader markets for the products of industry.

Its work should gain momentum by the selection first of some limited field—radiant heating, or light-weight building materials, as random examples—on

which a worth-while report could be made to the building industry. While none will deny the value of basic research, its abstract theories cannot always be appreciated by the average building contractor. If BRAB can come up with a practical report based on applied research that will save somebody money, it should certainly move ahead toward its objectives. We wish it well!

Of Engineers and Brooms

To the Editors,

CONTRACTORS AND ENGINEERS MONTHLY:

My attention has been drawn to the illustration on page 59 of your March issue. Mention is made of the engineers who visited the first annual National Trailer Coach Exhibit, and the picture presumably portrays a trailer coach set up as an engineer's office.

I am impressed with the meticulous attention to detail which has been given to this exhibit. Experience with engineers' field officers, which extends over a period of many, many years, causes me to appreciate the inclusion of the shovel alongside the broom tucked in the corner of the coach. Speaking as an engineer, I realize there are times when a broom is entirely inadequate.

Yours very truly,
Fred T. Evans
Seattle, Wash.

Prestressed Concrete

American engineers and contractors are demonstrating an ever increasing interest in the development of prestressed concrete techniques and applications. Thus the appearance of the first American edition of Dr. P. W. Abeles' book "The Principles and Practice of Prestressed Concrete" is timely. All notations in the new text have been adapted to the American standard, and incidentally are also contained on a loose sheet insert for easy reference while reading.

Prestressed concrete, Dr. Abeles points out, has become an important new material in structural and civil engineering. Originally conceived by American engineers, it has gained its principal development in Europe as a result of the difference in cost ratio between materials and labor within the two continents. With its many features, it has, however, assumed greater importance in American design.

The text clearly and concisely explains the principle of prestressed concrete, indicates its distinctive features, and describes the various systems and methods used. Analysis, design, and practical applications are properly developed and are illustrated with a large number of photographs and diagrams. The summary includes a strong argument for the advancement of prestressing application.

"The Principles and Practice of Prestressed Concrete" by P. W. Abeles is available from the Frederick Ungar Publishing Co., 105 E. 24th St., New York 10, N. Y. Price of the volume is \$3.75.

CIMA Election Results

The Construction Industry Manufacturers Association held its annual meeting at Cincinnati, Ohio, recently, in conjunction with the annual meeting of the American Road Builders' Association.

Seven new directors for CIMA were elected: Leonard W. Beck, Vice President, Cummins Engine Co.; C. Findley Boyd, Vice President, Galion Iron Works & Mfg. Co.; E. B. Hill, Vice President and General Manager, Road Machinery Division, Gar Wood Industries, Inc.; Kenneth Lindsay, Vice President, Iowa Mfg. Co.; F. Salditt, Vice President, Harnischfeger Corp.; Gail E. Spain, Vice President, Caterpillar Tractor Co.; and Julien R. Steelman, Vice President, Koehring Co.

At the meeting of the CIMA Board of

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Directors immediately following the annual meeting, the directors selected the following officers for 1950: President, Ralph K. Stiles, Austin Western Co.; First Vice President, William E. Miles, The Oliver Corp.; Second Vice President, B. F. Devine, Chain Belt Co.; Secretary-Treasurer, Julien R. Steelman, Koehring Co.; and Executive Vice President, Harold F. Hess. The board also appointed G. A. Gilbertson, Vice President of the Frank G. Hough Mfg. Co., and W. B. Greene of Barber-Greene Co. to fill vacancies on the board.

Rigid-Frame Bridges

Arthur G. Hayden, Consulting Engineer, formerly Designing Engineer for the Westchester County Park Commission, and Maurice Barron, of Farkas & Barron, Consulting Engineers, New York, N. Y., have collaborated to author the third edition of "The Rigid-Frame Bridge". The text presents a simplified method of analysis for skewed-arch and frame bridges—a method by which design time and cost can be saved; complex theories or higher mathematics are eliminated; the possibility of errors is reduced; and a source of standardization is offered, in that a square-span structure once completely designed may be used as a basic structure for a whole family of skewed structures.

In the new edition, about 120 pages of obsolete information have been replaced with current material and many new illustrations have been added. The authors state that the design of the single-span skewed-frame bridge is now almost as easy as that of the unskewed structure, and that of the double-span skewed structure—so useful for dual highways—is easily understood. The principle of the rigid-frame bridge is set forth and followed by the theory of indeterminate analysis, methods of calculations, practical points of design and construction, and data on research being done in the field.

Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York, N. Y., the new text costs \$5.00.

1949 Road School Papers

The papers presented at the 35th Annual Road School, Purdue University, April 11-14, 1949, have been published by the University. They cover problems relative to highway construction, administration, and maintenance, and summarize developments in research.

Copies of the bulletin, "Proceedings of the Thirty-Fifth Annual Road School", may be obtained by writing to Professor Ben H. Petty, Department of Highway Engineering, Purdue University, Lafayette, Ind.



Soil Work Under Way In the Missouri Basin

Present Work at the Head of The Mighty Missouri River Is Confined to Agricultural Improvement Practices

• SOME day, perhaps not too far away, engineers are going to turn to the soil of the great Missouri Basin to help whip the threat of destructive floods. How soon they will take agriculture fully into consideration is anybody's guess, but the ambitious Department of Agriculture plan for the basin is now on paper.

In the town of Three Forks, Mont., where the Madison, Jefferson, and Gallatin Rivers come together to start the Missouri River, a field office of the Soil Conservation Service is established and operating. Its activities now consist of what all 10 Montana work group offices do: aiding with modern engineering the established soil conservation and drainage districts in the area.

So far the Three Forks office has had no part in the Missouri Basin plan, beyond routine studies and activities connected with several Case-Wheeler irrigation projects, in conjunction with the U. S. Bureau of Reclamation. But Soil Conservation Service engineers explain that every bit of agricultural engineering which stops the loss of topsoil is helping the Basin program by just that much.

Nine Counties Included

The work group office at Three Forks, one of the subdivisions of the Montana state office of the Soil Conservation Service, supervises work in 9 counties. These are Gallatin, Broadwater, Madison, Jefferson, Lewis and Clark, Park, Meagher, Silver Bow, and Beaverhead Counties. Taken together, they form a sizable block of land in the third largest state in the nation.

It is an ideal spot to start with soil conservation. Normal rainfall is less than 16 inches a year, so soil engineers can encourage crop practices which use all of the available rainfall. At the same time, the confluence of many streams which carry snow runoff water from the mountains furnishes a plentiful supply of water for irrigation, if the farmers want it.

Carried a step further—and here is where contractors come in—the water table is so high in several places in the 9 counties that extensive drainage works are now either planned or under way. These works are designed to train the excess ground water away to the rivers, thus lowering the water table and making more land available for agriculture.

There are 10 work groups in Montana, having a total of 49 soil conservation districts. In the Three Forks work group there are 7 conservation districts.

A conservation district is a subdivision of state government operated under democratic governmental principles. A district is formed by initiating a petition. The State Soil Conservation Committee, composed of men in

interested in that field, then holds several hearings. If it determines that the group is in earnest, either pro or con, an election is held. A 65 per cent majority of the land owners and occupiers must vote for the establishment of the district before the state will grant a charter.

When a district is established, farmers in that group are permitted by law to ask the engineers and other experts of the U. S. Soil Conservation Service for help in working out their problems of drainage, land leveling, water storage, irrigation, and other things dealing with the use of the soil.

Max Hughes is in charge of the office at Three Forks, and his small staff is spread quite thin to cover all the engineering requests. The Three Forks



U. S. Soil Conservation Service Photo
Here a Montana ditch, badly eroded, was filled with the aid of nature by placing temporary check dams to catch the silt. No machinery was necessary.

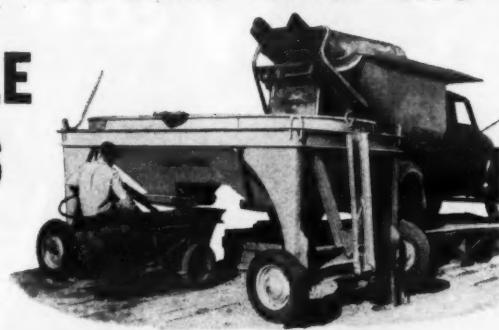
office does a great deal of land leveling and drainage work, and to a smaller extent, water conservation.

Main drainage projects include the

Belgrade Drainage Project, involving over 12,000 acres. There are also the Lower Deep Creek, Crow Creek, Jeffers

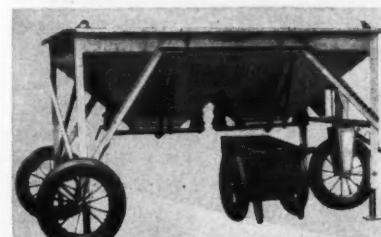
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GAR-BRO for FASTER CONCRETE HANDLING PORTABLE HOPPERS

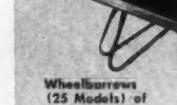


SAVE COSTLY TRUCK DISCHARGE TIME by dumping concrete directly from the truck mixer into this low, Portable Hopper. No ramps or jacking up required. This Gar-Bro Hopper is designed especially for the large jobs using 3 or 4 cu. yd. truck mixers. Has two center-discharge, self closing, grout tight gates. Is available with heavy duty wheels with pneumatic tires or steel rims. Ground clearance, 34", permits use of carts or wheelbarrows. Twin bins have self-cleaning design. Capacity is 125 cu. ft. Write for catalog.

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Concrete Carts (6 Models) cap. 6 to 8 cu. ft.



Tower Buckets (5 Sizes). Cap. from 8 to 36 cu. ft. Chutes available.

Special Concrete Handling Equipment built to your specifications.



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EQUIPMENT
CATALOG NUMBER 75-2



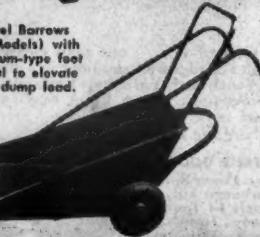
Laydown Concrete Buckets (8 Models) for use with transit mixers. Cap. from 1 to 5 cu. yds.

Concrete Floor Hoppers (20 Models). Cap. from 1/2 to 10 cu. yds.

Power-Cart handles 12 to 14 cu. ft. at 6 to 8 miles per hr. Turns in 4' radius.

Shovel Barrows (2 Models) with fulcrum-type foot pedal to elevate and dump load.

Two-wheel Barrows (6 Models) of all styles.



GAR-BRO

MANUFACTURING
COMPANY

2416 E. 16th ST., LOS ANGELES 21
DEALERS EVERYWHERE

DAVEY COMPRESSORS



ONLY COMPRESSOR
WITH PERMANENT
PEAK
EFFICIENCY
LIFETIME
VALVES

DAVEY COMPRESSOR CO.
KENT, OHIO

MAY, 1950
are a few
don't want
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As one D
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dence!"



U. S. Soil Conservation Service Photos

Before development, rangeland infested with cacti near Three Forks, Mont.—photo at left. Photo at right—the miracle of water!

Soil Work Under Way In the Missouri Basin

(Continued from preceding page)

and Waterloo Drainage Projects which will affect from 1,500 to 3,500 acres each.

Work for Contractors

While the Three Forks office has four pieces of Government equipment which are used for various earth-moving projects, most of the work is being done by the contract system, on a per hour basis. Working almost continuously near Three Forks, all through the working season, are contractor-owned machines including an International TD-18 tractor with a bulldozer blade and LeTourneau Carryall, a D7 Caterpillar with similar equipment, and a 1/2-yard Koehring dragline. This can be duplicated at Madison, except there the machines include a TD-18, a TD-14, and a 1/2-yard P&H shovel.

The same set-up prevails at Whitehall, and there are several tractor-Carryall combinations around Helena. Main contractors who work these machines in cooperation with the soil conservation districts are Ray Pierce, Virgil Ward, Fullerton & Workman, Clarence Bails, "Sonny" Jackson, Lee Watts, Earl Larson, and the firm of Robertson & Cave.

Government equipment is limited to a Michigan 1/2-yard dragline, a TD-14 dozer-Carryall combination outfit, and a small Caterpillar D4 and D2.

When a farmer gets ready for dirt work, he contacts Soil Conservation Service engineers, through the soil conservation district. The engineers come out, stake the work, and make suggestions. The suggestions are not binding on the farmer, except that the Soil

Conservation Service will not waste time on a project which a farmer wishes to do at a wide deviation from Soil Conservation Service standards.

When a job goes into the active stage, the district then draws up a working agreement between itself and the contractor. As a rule the engineering, staking, suggestions, and general supervision come from the Soil Conservation Service.

Practically all approved construction work, cleared through the Soil Conservation Service, the local district, and the PMA, is subsidized to some extent. PMA pays about 9 cents per cubic yard back to the farmer for the cost of earth-moving, for example, and other activities rate in similar proportion. A

farmer spending \$5,000, say, for a land improvement plan, can figure on getting about half of it back in the form of a Government check, if he does things properly to agree with rules and regulations of the PMA.

It must be said, however, that there
(Concluded on next page)

jari cuts
12 MILES A DAY!



Think of it . . . one man cleans up 12 miles of highway shoulder in a single day . . . with Jari. Yard wide knife cuts weeds, mows park lawns. Light easy-to-handle Jari cuts on steep slopes . . . gets in where big rigs can't.

HERE'S GOOD NEWS
Jari Power Spray Attachment. kills weeds with 14 foot wide spray. Hose reaches trees. Write for full details.



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POWER SCYTHE
AND SPRAY

Jari Products, Inc.
2940 R Pillsbury Ave.
Minneapolis, Minn.

**CUT your
hourly cost...UP your
hourly
production**

**with
Firestone
TIRES**

ROLLING equipment represents a profitable investment, but idle equipment means dead loss. When a unit stops, production stops—but costs go right on. We say—and we'll welcome a chance to prove it—that we can shorten your downtime and boost your production with Firestone Tires.

- **WE CAN DO IT** because we carry a complete line to furnish you the right tire for your type of work.
- **WE CAN DO IT** because there's extra material, extra quality, extra skill put into every tire we make.
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GROUND
GRIP



EARTH MOVER



ROCK GRIP



ALL TRACTION

When you buy new tires or new equipment
always specify **Firestone**
OFF-THE-HIGHWAY TIRES

are a few rugged individualists who don't want subsidies. In that case they are certainly not urged to take them. As one Department of Agriculture man remarked, "Makes you feel good to see a man farming in such an intelligent way that he's got that kind of independence!"

Guidance on Crops

Soil Conservation Service men will admit frankly that they use all possible persuasion—nothing else—to suggest crops. One man can prove that peas cause more erosion than any other crop in that work group unit. Another says that he can prove, on paper at least, that crested wheat grass marketed in the form of beef is a better-paying crop than wheat farming.

The criterion of these suggestions is not economics, but rather a technical engineering solution to the problem of saving the land. If the land stays put, and is covered by grass or other adequate cover crops, the engineers believe that stream siltation and flood peaks should fall off.

Irrigation Work

Irrigation never ends at the end of the lateral canals from the impressive dams and reservoirs. In fact, many of the distribution problems start there. Hughes' office does a great deal of work staking land, and grading in such a way that the water can be distributed and used without causing severe erosion.

Canals dug under his supervision are generally sloped just enough to carry the water. Drainage ditches have been standardized with a 4-foot bottom and 1½ to 1 side slopes. For a while 1¼ to 1 slopes were used, but they eroded badly and would not stand up.

Pumping stations now are coming into the picture. One of the most successful types was recently finished near Three Forks. It consists of 72-inch-diameter concrete pipe in 3-foot sections, placed end to end to form a well. A 36-inch intake is then placed into this well, the whole thing backfilled, and a 4,000-gpm pump installed. The pump just installed will operate at rated capacity on a 17-foot lift and irrigate 400 acres of good land. These stations, of course, are along the river.

When the Missouri Basin flood control plan gets ready for agriculture, the Soil Conservation Service will be ready with the nucleus of a fine organization in these work group set-ups now interested primarily in agriculture.

Wood Concrete-Forms

Improvements in its line of wood concrete-forms have recently been announced by Symons Clamp & Mfg. Co., 4251 Diversey Ave., Chicago 39, Ill. They are: corners reinforced with steel corner plates; panels that may be reinforced with steel cross-members to guard against bulging where extremely heavy pressure is encountered; ring shank nails for securing sheathing to the frame; frames now recessed where steel straps secure joints; ¼-inch exterior grade AB-DFDA (marine) plywood used in the 2 x 6-foot and 2 x 8-foot sizes, finished with sealed edges ready for assembly; and steel wedges curved at each end to prevent their digging into the wood.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 143.

Bulk-Cement Conveying

A 24-page catalog describing bulk-cement conveying equipment has recently been offered by the Fuller Co., Fuller Bldg., Catasauqua, Pa. Bulk-cement shipments, the company points out, are now commonly made in hopper-bottom cars, trucks, boxcars, barges, and ocean-going vessels. In that order, this bulletin illustrates and describes typical installations of Fuller



U. S. Soil Conservation Photo
After digging this silage hole, a bulldozer fills it with cattle feed.

cement-handling equipment for contractors and for operators of ready-mixed concrete and concrete-products plants.

All components of the complete system are described in detail. Six standard sizes of stationary Fuller-Kinyon

pumps are available to provide a wide range of capacity. The pipe line consists of standard steel pipe furnished in cut lengths fitted with flanges, bolts, gaskets, and long-radius pipe bends; it ranges in size from 3 to 10-inch diameters. Two and three-way cut-off di-

verting valves, actuated by remote control, make it possible to direct the flow of material through the branch lines to any part of a plant or number of receiving bins. High and low-level material indicators may also be furnished for bin, hopper, or silo and for any predetermined level indication. Automatic and remote control of material distribution can be furnished.

This bulletin, FK-20-A, may be obtained from the company or by using the Request Card at page 16. Circle No. 55.

B&D Service Station in Oregon

A factory-owned and operated service station has been built by Black & Decker, Towson 4, Md., at 1640 N. W. Johnson St., Portland 9, Oreg. Its repair and service facilities will be available to users of the B&D portable and electric tools in Oregon, southern Washington, and southern Idaho. Gus Nelson, Service Engineer, and A. W. Escoffier, Sales Engineer, will be in charge.



Preformed that lasts longer and
saves money! . . . that's why

Today it's Roebling!

YOU WANT ROPE that's *extra* tough, *extra* long-lived! And you *get* these extras in Roebling Preformed "Blue Center" Wire Rope, for "Blue Center" steel has completely superior resistance to abrasion, shock and fatigue. Roebling developed and is the only maker of "Blue Center" steel . . . and Roebling research, workmanship and modern, precision machines are your added assurance of rope quality that pays off.

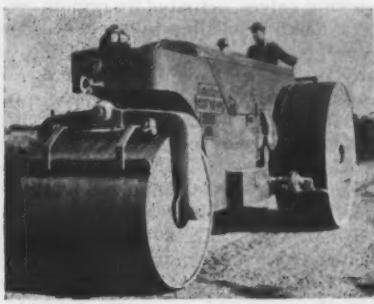
But for everything wire rope can give, be sure to get Preformed. Roebling Preforming makes rope easier to handle and install. It can be cut without seizing. It spools better . . . is not inclined to set or kink . . . minimizes vibration and whipping.

There's a Roebling wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field Man tell you which rope will give the best and the lowest-cost performance for every installation. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING 

A CENTURY OF CONFIDENCE

Atlanta, 934 Avon Ave. * Boston, 51 Sleeper St. * Chicago, 5525 W. Roosevelt Road * Cincinnati, 3252 Fredonia Ave. * Cleveland, 701 St. Clair Ave., N. E. * Denver, 4801 Jackson St. * Houston, 6216 Navigation Blvd. * Los Angeles, 216 S. Alameda St. * New York, 19 Rector St. * Philadelphia, 12 S. Twelfth St. * Portland, 1032 N. W. 14th Ave. * San Francisco, 1740 Seventeenth St. * Seattle, 908 First Ave. S.



Five new models of Buffalo-Springfield variable-weight 3-wheel rollers have been brought out. They range in capacity from 5 to 12 tons.

Three-Wheel Rollers Of Variable Weight

A new line of variable-weight 3-wheel rollers equipped with ballast-type rolls has been announced by the Buffalo-Springfield Roller Co., of Springfield, Ohio. These rolls are constructed with heavy steel rims which are welded to steel head plates and, with the hub, form a watertight compartment. Filling and drain plugs are installed in the outer heads to facilitate ballasting. On models where wet-sand ballast is desired, a shovel opening with a bolted watertight cover is provided in the outer head. Machine-finished roll surfaces enable these new rollers to be used on finishing work as well as on subgrades and stone, according to the company.

There are five new models available in the 3-wheel roller line. They range from 5 to 7-ton capacity for miscellaneous work up to the largest model with working weights from 10 to 12 tons. They are powered by 6-cylinder heavy-duty industrial-type gasoline engines. Emphasis is placed by the manufacturer on the exclusive 4-speed transmission and the high-speed low-torque clutches built into these rollers. The 4-speed transmission permits a continuous range of roller speeds from 1.7 to 5.2 mph. Maneuverability is achieved as a result of the high-speed low-torque clutches. A single clutch lever permits the operator to reverse the roller without stopping to shift gears.

Further information may be secured by requesting Catalog S-60-50. Or use the Request Card at page 16. Circle No. 144.

Reproduces Drawings, Papers, and Photos

The new 24 x 36-inch Spee-Dee Whiteprinter manufactured by Peck & Harvey, 5736 N. Western Ave., Chicago 45, Ill., is designed to make clear, accurate black-on-white or blue-on-white positive prints from transparencies, at less than 2 cents per square foot, the company reports. It provides prints in one minute and duplicates drawings, tracings, layouts, sketches, letters, invoices, agreements, records, data sheets, charts, or any written or printed matter. It also makes photocopies. The portable Spee-Dee Whiteprinter plugs into any standard 110-volt ac outlet. It is also available in 12 x 18 and 18 x 24 sizes.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 97.

Plywood for Construction

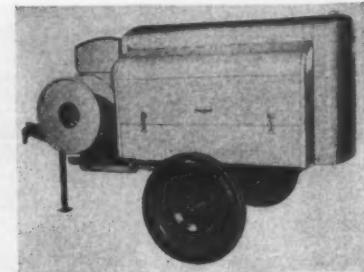
The 1950 basic catalog for Douglas fir plywood is available from the Douglas Fir Plywood Association, Tacoma Bldg., Tacoma 2, Wash. The 20-page booklet gives the various plywood grades, uses in construction, physical properties, and specifications. Of principal interest to contractors is the information about re-usable concrete forms of plywood.

This literature may be obtained from the association, or by using the Request Card at page 16. Circle No. 54.

Two New Compressors

Two new portable air compressors, the Model 105-P with 105-cubic-foot capacity and the Model 70-P with a 70-cubic-foot capacity, have been added to the line manufactured by Gordon Smith & Co., Bowling Green, Ky.

Single-stage compressors, both models are built with heavy-duty Chrysler industrial engines, using three cylinders for power, three for compression. Mounted on two pneumatic tires, they may be towed at truck speeds from job to job. Other features of interest, as pointed out by the company, are operating economy and practicality for use in rough terrain and hard-to-get-at places; the absence of couplings and clutch; and the minimal number of



A new Model 105-P portable air-compressor with a 105-cubic-foot capacity announced by Gordon Smith Co.

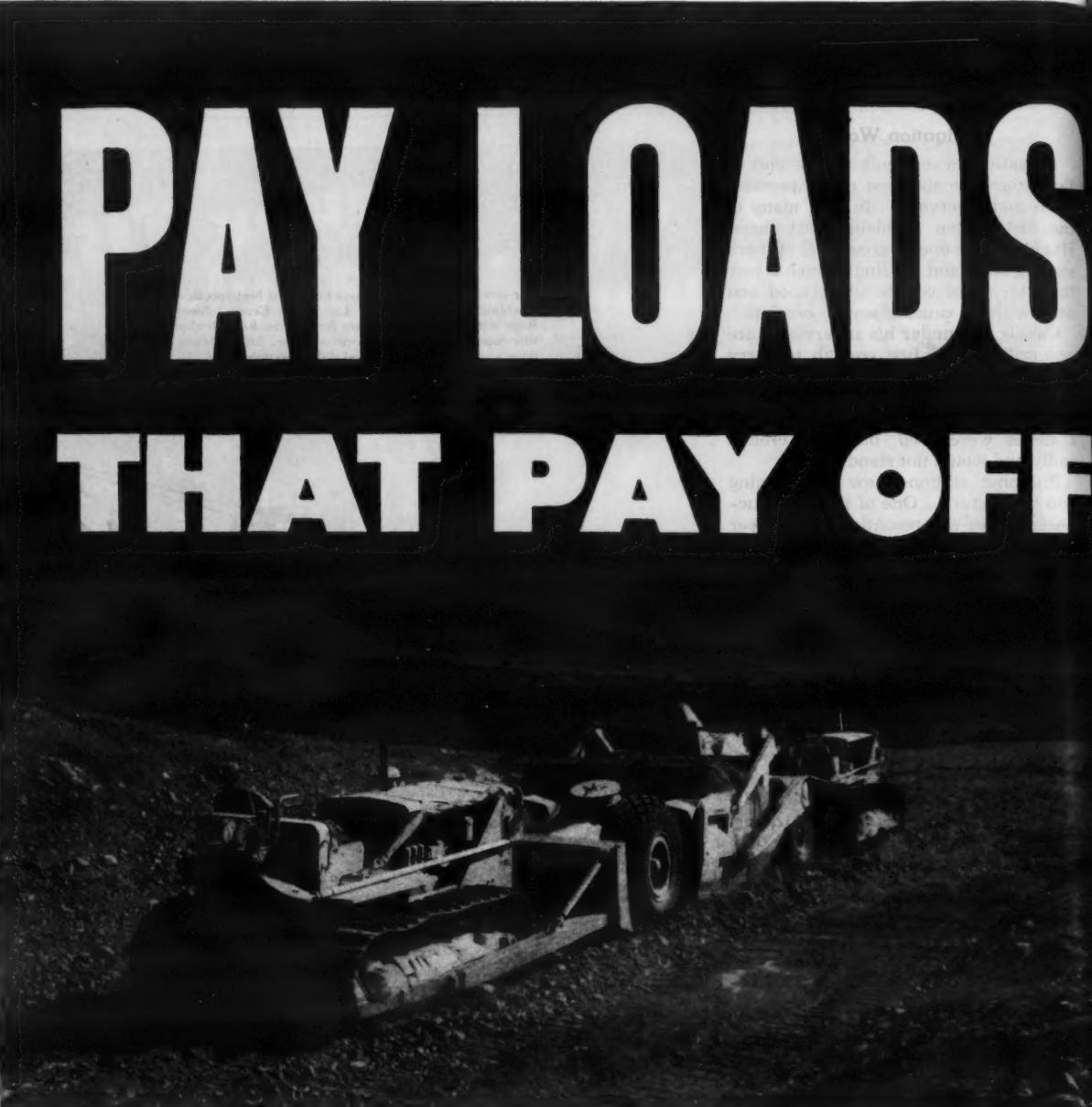
fittings. The 105-P has an overall length of 115 inches. It is 65 inches wide and 62 inches high. Dimensions for the 70-P are 103, 65, and 62 inches, respectively. Further information may be secured

from the company. Or use the Request Card at page 16. Circle No. 94.

Leaves Army Engineers To Set Up as Consultant

H. R. Norman, former Chief of the Engineering Division of the Galveston Corps of Engineers District, left Government service in February to become a consulting engineer in Houston, Texas. His position was filled by M. A. Dillingham, who had been Chief of the Galveston District reports branch.

Mr. Norman entered government service in 1927 and has planned navigation and flood-control projects for the Ohio, Mississippi, and Missouri Rivers, and Texas rivers and waterways.



QUICK, big, constant loads . . . they spell SPEED, VOLUME, PRODUCTION. And it's the tractor that plays the biggest part in the pay-off. You get the very tops in results when you sign up the power, capacity, and dependability that "Caterpillar" Diesel Tractors offer—the kind you see working on the state highway construction project pictured and described above.*

Says Contractor O. D. Cowart: "From my experience, 'Caterpillar' Diesel Tractors are unbeatable. Their ability to take punishment with a minimum of repairs makes them unquestionably the leader in the construction field."

That's putting it broadly. It's sustained slugging power that counts. Like the prize fighter who can stay on his feet round after round, it's the tractor which day after day can "take it and give it" that's the real profit-maker in the long run. "Caterpillar"

★
New Mexico, near Silver City. Two "Caterpillar" Diesel Tractors push-and-pull-loading a "Caterpillar" No. 90 Scraper with 11½ yards of tough rock in a trifle over a minute—thanks to matched equipment and 130 honest drawbar horsepower. On 800-ft. one-way hauls the hauling team averaged 8 trips and 90 pay yards an hour. Total excavation (5.6 miles) 130,000 yards—about 60% rock. Two other "Caterpillar" Diesel Tractors, with Scrapers and Bulldozers, were also used on this work.

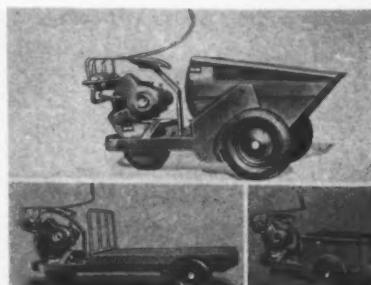
Diesel Tractors are made of that kind of stuff. They're tough! They don't need "long counts" (down time). They're quick on the comeback . . . should a new part or fix-up be in order, there's an efficient and quick-acting dealer service standing by. "Caterpillar" leaves nothing undone toward building—and keeping—60-second minutes, 60-minute hours, 24-hour days of fighting performance into every unit that bears its name. Ask your "Caterpillar" dealer for the proof—in mechanical evidence, in user experiences, in demonstrations.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

Materials Handling With a 3-Style Cart

Three interchangeable trays are featured in the improved Power-Cart offered by Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles, Calif. With a load capacity of 2,000 pounds or 14 cubic feet of bulk material, the unit will travel at speeds up to 10 mph and climb 20 per cent grades, according to the company.

The bulk-handling tray is balanced on trunnions at each side and dumps or pours under the control of the operator. A trip-latch releases the tray and a tilt-brake holds it at any pouring angle. Bulk tray, box, or platform tray can be quickly interchanged. Steering and power control are by tiller which



Bulk tray, box, or platform tray can now be interchanged on the Power-Cart.

engages a 7-hp 4-cycle engine. Speed is controlled by a foot throttle. The single rear wheel permits U-turns within a radius of 4 feet. Construction is all-electric-welded steel plate. Over-

all length is 85 inches, width 39½ inches, and height 50 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 73.

Rejoins Detroit Automotive

O. B. Casey has rejoined Detroit Automotive Products Corp., formerly the Thornton Tandem Co., where he has assumed the duties of National Service Manager. He will supervise the preparation of a training program for the personnel of all truck dealers and regional warehouse dealers who are selling and servicing Thornton drives, Load-Booster third-axle units, NoSpin differentials, and other truck equipment.



The Ipco Weldscope—a welding shield with a periscope for those offset or close places where you can't see what you're doing. Gives a true picture—no reverse effect. It's 18 inches in length.

A Periscope Shield For Special Welding

A new specialized welding shield for getting into offset or close places where the welder cannot normally see to make the necessary weld has recently been developed by Industrial Products Co., 2855 N. Fourth St., Philadelphia 33, Pa. The new device comprises a conventional type of fiber shield to which has been adapted a form of periscope, improved in mechanical design to make it practical for the welding operation. It gives a true picture with no reverse effect.

The Ipco Weldscope consists primarily of fiber over a reinforced periscope frame, with close-fitting face shield. The welding glass is on the inside where it is protected, and is instantly turned out of the way of vision by a conveniently located trigger operated by the index finger of the same hand in which the shield is held. The welding glass automatically returns to the welding position when the trigger is released. Both inside and outside openings of the shield are protected by a clear cover plate. An offset fiber handle gives a secure grip. Length, including the handle, is 18 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 141.

Multi-Purpose Grease

A multi-purpose grease known as Litholine has been placed on the market by the Sinclair Refining Co., 639 Fifth Ave., New York, N. Y. Litholine is designed for use as sole lubricant on a job or in a shop. Its multi-purpose feature permits the use of one grease and one grease gun for an entire job, and eliminates the danger of misapplication through use of the wrong grease, Sinclair says. In addition, the company points out, the operator will be able to serve more vehicles in a shorter time, and secure efficiency from all lifts, ramps, or stalls available.

Litholine is made from a combination of lithium base soap and a highly refined mineral oil. Company performance reports indicate long life for the grease, high resistance to heat and cold, as well as water, and great protection against rusting.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 106.

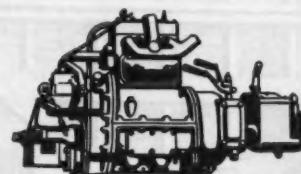
Rope Slings and Fittings

A 16-page booklet about Purple Strand wire-rope slings and fittings has recently been prepared by Bethlehem Steel Co., Bethlehem, Pa. It illustrates and describes slings for construction and lists pertinent specifications for each. Standard types offered include single-part, grommet, braided single-leg, choker, braided choker, choker hitch, single-leg lifting, 2-leg bridle, and 2 and 4-leg braided bridle slings. Complete data are also given on wire-rope sockets, eye hoist hooks, links, thimbles, rings, and anchor shackles.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 35.



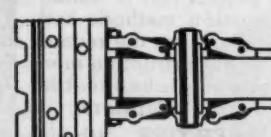
Alloy Iron Wet Type Cylinder Liners are "Hi-Electro" hardened—giving exceptionally long life. Wearing surface is chemically treated for proper break-in.



Independent Starting Engine of exclusive "Caterpillar" design gives safe-and-sure starts at all times, and allows the Diesel to build up full oil pressure before starting.



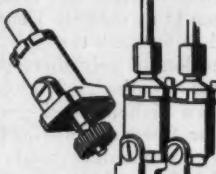
"Hi-Electro" Hardened Final Drive Gears. Teeth are three times harder after treatment and gear life is further boosted by the favorable compressive stress this process supplies.



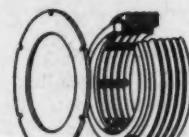
Counterbored Track Links—to provide a tighter, better sealed joint and greater bearing surface between bushings and track pins. Extra assurance of long life in abrasive soils!



Solid Aluminum Alloy Connecting Rod and Main Bearings are exclusively "Caterpillar." Advantages: low rate of wear; fine heat-transfer characteristics; high corrosion resistance.



"Caterpillar"-Built Fuel Injection System is perfectly matched for "Cat" Engines. Pumps and valves require no adjustments, and are replaceable in the field—like spark plugs.



Bellows Seals are self-aligning, self-adjusting and self-lubricating—keep oil in, dirt and water out without need for take-up adjustment or periodic attention.



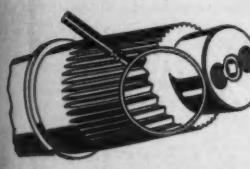
Hour Meter to give user the facts on tractor performance and life. Hour meters have always been standard on "Cat" Engines because "Caterpillar" has nothing to hide.



Chrome-Faced Compression rings are standard on all models of Caterpillar Diesel Tractor Engines increasing life and performance at critical point of engine design.



Air-Cooled "Lube" Oil. Air cooling lowers oil temperatures—reducing carbon, minimizing gum formations, and adding to the efficient service-life of working parts.



Sperpered Splines—specially developed "Caterpillar"—lock sprockets securely to shafts. So effective have they proved that the principle is similarly applied to other vital parts.



Correct Track Alignment, both vertically and laterally, is assured with its rigid roller frame. Heavy diagonal brace and widely spaced bearings add life to tracks and rollers.

CATERPILLAR
DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Dual-Lane Highway Graded at Fast Pace

(Continued from page 1)

Robert Lee, Inc., of Manning, S. C., and Cherokee, Inc., of Columbia, S. C. Their joint low bid for this phase of the work was \$470,000, and this initial contract was completed by the end of May, 1949. Bridge and paving contracts that followed brought the total estimated cost of the project to \$844,500.

Good Grading Performance

The new right-of-way is through rolling country, sparsely settled except for one Negro community known as Boog-a-boo Village. To make room for the new highway, some sixty homes were moved by Robert Lee, Inc., holder of a subcontract for \$24,135. All structures were moved safely and placed just off the lines of the new road. Clearing and grubbing were handled by both machines and men. Three power saws were available in felling



C. & E. M. Photo

A Terra Cobra is loaded with 14.7 cubic yards of material during grading operations. A Cletrac push tractor helps.

the larger trees, while dozers and hand tools took care of the necessary grubbing. Growth was densest in some swamp areas through which the new highway line is located.

In draining the roadbed, over 2 miles of reinforced-concrete pipe was laid, ranging in size from 15 to 48-inch diameter; also 93 drop inlets. The open inlets were spotted along the center of the median strip at approximately 500-foot intervals. They collect storm water which is drawn off through down spouts at the bottom of the structures. From these spouts the pipe turns through a 90-degree elbow to run out to the side of the embankment. Most of the pipe was laid with the help of a Koehring crane equipped for the purpose with a 30-foot boom. The pipe was supplied either by the Southeastern Concrete Pipe Co. or the Carolina Concrete Pipe Co. of Columbia, S. C.

Dirt in connection with the grading operations began to fly early in December, 1948, and continued through the winter with the loss of only three days because of bad weather. The contractors worked a 55-hour week—or 10 hours a day for five days during the week, and the 5 remaining hours on Saturdays. They moved nearly 2,000 cubic yards of material per hour, averaging 100,000 yards a week over a two-month period. At the peak of construction 97 men were employed. By the middle of March nearly 85 per cent of the earth work was completed, while less than 25 per cent of the contract time had expired.

Wide Roadbed

In the cut sections the roadbed is 100 feet wide; in the fills, 92 feet. The two 24-foot pavements, which have a 2-inch center crown, are separated by a 24-foot median strip depressed 12 inches along the center line. Outside edges of the pavement are flanked by 10-foot shoulders with a 12 to 1 slope. In the cuts there is a distance of 4 feet from the shoulders to the bottom of the 2-foot-deep ditch. The slopes in both cut and fill sections are 2 to 1. The median strip, shoulders, and roadway slopes are covered with a layer of topsoil, 4 inches thick, to insure the development of grass and sod, and to prevent erosion.

Not included in the initial contract were the base course, paving, or bridge items. The base is a 10-inch course of sand-clay mix, the material being obtained in the general vicinity of the project. The pavement consists of a 2-inch course of asphaltic concrete. The major structures were let in two separate contracts. One contract included two overwater bridges to carry the dual-lane highway across Big House Creek and Clearwater Pond. The other contract involved three overhead crossing structures—one with the Southern railway at Graniteville, another with a county road, and the third with State Route 191. The dual 24-foot paving widths are maintained at all bridges, with a 4-foot divisor strip.

The bridge and base-course contracts

were well along by the end of last construction season. The paving is being done this year; thus the fills had a full year for settlement.

Dirt-Moving

The material over the entire job is a sandy clay, portions of which contain (Continued on next page)

dewater the Complete way

WELLPOINTS
ON THE JOB

Pre-drainage with Complete Wellpoint Systems prevents trouble wherever subgrade water is a problem. By eliminating the water hazard, you usually eliminate any need for sheeting—you often are able to continue operations even in sub-zero weather—you frequently can use equipment which "wet grounds" would rule out—and you always can count on completion in scheduled time at scheduled costs!

Write today for Complete Catalog Dept. CEM

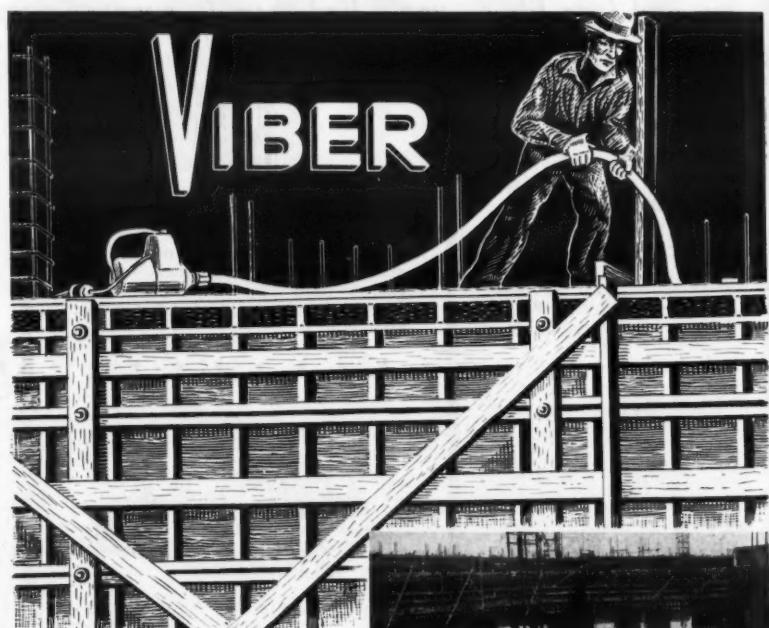
COMPLETE MACHINERY & EQUIPMENT COMPANY, INC.

36-40 11th STREET
LONG ISLAND CITY, N. Y.

Branch Warehouse
3rd AVE & ADAMS ST.
GARY, INDIANA

COMPLETE WELLPOINT SYSTEMS

FOR SALE OR RENT



Now in use on one of the largest architectural concrete construction jobs in the United States

New architectural and engineering techniques are being pioneered on the Metropolitan (Parklubrea) Housing Project in Los Angeles.

VIBER SELECTED... One of the five unusual features of this tremendous project is an effort to reduce time, effort and costs in concrete placement operations. The exclusive use of Viber equipment on a project that is testing new construction methods and techniques illustrates the regard engineers and construction men have for this interchangeable line of concrete vibrators.

VIBER RUBBER TIPS... Viber's development of rubber tips has reduced damage to expensive forms...an important phase of architectural construction costs.

GOVERNMENT AND RESIDENTIAL HOUSING... The vast program of Government and residential housing now in planning and process is just one of the fields in which Viber plays an important role.

For further information on the complete line of Viber Interchangeable Vibrators, please wire or write

VIBER COMPANY

CONCRETE VIBRATORS SINCE 1931
Dept. 25, 726 South Flower Street, Burbank, California.



\$40,000,000 Parklubrea Housing Project, Los Angeles



C. & E. M. Photos

A 13-yard bottom-dump Euclid (left) places topsoil on a cut slope of the U. S. 1 relocation in South Carolina. The two tractor dozers above are spreading it—the D7 on the slope hooked by a 1-inch cable to the D8 on top of the slope.

kaolin, which is fairly common in that part of South Carolina. No rock was encountered, and the sandy clay was easily moved in the dry weather that prevailed in that section of the south through most of the 1948-49 winter. One roadside borrow pit, which yielded about 70,000 cubic yards, was required to balance out the quantities from the cuts and fills. The maximum height of fill and depth of cut was 35 feet.

Dirt was moved primarily by self-propelled scraper units and Euclid wagons. The former included nine machines—seven Terra Cobras and one LaPlant-Cheate rated at 14.7 yards struck capacity, and one Tournapull at 11 yards. The Euclids numbered eleven bottom-dump wagons which carried 13 yards. At the start of the grading operations the Euclids were loaded by two Northwest No. 6 draglines equipped with 40-foot booms and 2-yard buckets, a Hendrix and an Esco. Later on, a Euclid loader was put on the job to load the wagons. The loader was pulled by an Allis-Chalmers HD-19 tractor. The bottom-dump wagons were fully loaded in just a trifle over half a minute.

The average length of haul with both types of equipment was 1,500 feet, while the maximum haul did not exceed 3,600 feet. The self-propelled scrapers were assisted in loading by 4 push tractors—2 Allis-Chalmers HD-19's, one HD-14, and one Cletrac. The material was spread in 6-inch lifts and leveled off by 4 Caterpillar dozers—2 D8's and 2 D7's. The heavy equipment gave sufficient compaction, and the material was moist enough as it came out of the ground to make further watering unnecessary. Final shaping of the roadbed was handled by 5 motor graders—an Adams, 2 Caterpillar No. 12's, and 2 Galions.

Topsol on Slopes

Topsoil for the slope covering was stripped from fields adjoining the project. It was dug out to an average depth of 6 inches by the Euclid loader which filled the bottom-dump Euclids. The big wagons unloaded the material along the top of the cut slopes and on the shoulders of the fills. These windrows of topsoil were pushed down the slope by two tractor-dozers, a D8 and a D7, hooked together with a 1-inch steel-wire cable. The D8 usually rode along the top of the slope as an anchor for the D7, which operated along the side of the slope as its blade spread the black earth over the red-colored sand-clay. The final shaping and leveling off was done by a dozer pulling a timber drag over the slopes.

The fleet of earth-moving equipment

was kept in good working condition by lubricating each unit after every 10 hours of operation. The oil was changed in each engine after 60 hours of use. Greasing was done right in the field with Alemite and Graco lubricating units mounted on a Ford truck; D-A lubricants were employed. Diesel fuel was supplied by the Standard Oil Co. of

New Jersey, delivery to the project being made in transport trailer trucks. The oil was stored in two 6,000-gallon diesel fuel tanks, and distributed to the equipment by an FWD 1,000-gallon-

capacity tank truck.

All equipment repairs were handled right in the field, with the single exception of an engine that was removed

(Concluded on next page)



TAKE A CLOSE LOOK at the CABLE-OPERATED Clement Dump Trailer shown above. Note the absence of bulky hoists . . . gears and cylinders . . . heavy subframes and supports.



NOT HYDRAULIC—THE CLEMENT DUMP TRAILER

has been designed and engineered to perfection. Dead weight has been eliminated and replaced with a simple block and tackle system of dumping. This is the secret of Clement profit performance. The simplicity of design and sturdy construction allow greater legal payloads to be hauled faster and cheaper than with any other dump unit on the market.

We will furnish on request FREE CATALOG and estimates on the cable-operated Clement Dump Trailer, describing its versatility in spot, spread or angle dumping. It also explains the exclusive Clement feature of working out of mire and mud unaided.



Vulcan Tools

A complete line for every type of Rock Drill, Pavement Breaker and Clay Digger.

Vulcan Tool Manufacturing Co.
35-43 Liberty Street, Quincy, Mass.
Branch Offices and Warehouse Stocks.
74 Murray St. 34 No. Clinton St.
New York, N. Y. Chicago, Ill.

Clement

DUMP TRAILERS

MANUFACTURED BY

WINCH-LIFT, INC.
FIRST NATIONAL BANK BUILDING . . . SHREVEPORT, LOUISIANA

WINCH-LIFT, INCORPORATED

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Please send me the FREE booklet on the money-saving Clement "500".

Name _____
Company _____
Address _____

SHREVEPORT, LOUISIANA

Dual Lane Highway Graded at Fast Pace

(Continued from preceding page)

and sent to a repair shop for a rebuild-ing job.

Quantities and Personnel

The major items in this 10.8-mile grading and drainage contract for the dual-lane highway on U. S. 1 included the following:

Unclassified excavation	1,139,053 cu. yds.
Class A concrete	1,237 cu. yds.
Reinforcing steel	189,300 lbs.
Reinforced-concrete pipe, 15 to 48-in.	10,612 lin. ft.
Drop inlets	93

Alonzo Bailey was Superintendent on the grading for the two contractors—Robert Lee, Inc., and Cherokee, Inc. R. B. Hawthorne, President of Cherokee, Inc., gave the job his personal attention.

For the South Carolina State Highway Department, J. C. Asbill was Resident Engineer. The project is located in the Central District of which D. M. Crockett is District Engineer with headquarters at Columbia. The Department is headed by C. R. McMillan, Chief Highway Commissioner. S. N. Pearman is State Highway Engineer, and J. D. McMahan, Jr., is Construction Engineer.

Clear-Color Primer For Rust Protection

A new clear anti-rust paint has been added to the line of maintenance coatings produced by Speco, Inc., 7308 Associate Ave., Cleveland 9, Ohio. Known as Rustrem Clear, and said to have the penetrating and sealing qualities of other Rustrem products, the new paint can be brushed or sprayed directly over rust without wire brushing or scraping. The Clear can be painted over with any good-quality paint except lacquer. It will not bleed through painted surfaces, according to the manufacturer. When used as a rustproofing primer and undercoater, any desired finish color may be obtained. It is available in 1-quart, 1-gallon, and 5-gallon cans, and in 55-gallon drums.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 109.

New Electric Hammer

A new portable electric hammer identified as the Model No. 10, with a $\frac{1}{8}$ -inch-diameter drilling capacity, has recently been offered by the Syntron Co., 227 Lexington Ave., Homer City Pa. It is entirely self-contained, and the rectifying unit is now incorporated in the handle casting so that the operator plugs the hammer cord directly to a 110-volt ac power source.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 90.

Information on Electrodes

A new two-color 2 x 3-foot wall chart of welding information has been prepared by Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y. It lists over 100 EutecRods and EutecTrodes with their standard sizes, giving for each rod such technical data as: type of joint for which suitable, metal on which used, bonding temperature, tensile strength, Brinell hardness, degree of color match, electrical conductivity, resistance to corrosion, flame adjustment, etc.

There is also a section on 33 Eutectic alloys, with a brief discussion of their properties. A check list of close to 300 production and maintenance applications, with the rod or rods recommended for each, is also given.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 83.



Universal Trailer Corp. makes this mobile field office, 25 feet long overall and approximately 8 feet wide.

Mobile Field Office

A mobile field office for construction jobs, designed to eliminate the necessity for building temporary on-the-job offices, has been developed by the Universal Trailer Corp., 4884-90 N. Clark St., Chicago 40, Ill. The standard unit is 25 feet long overall; the body is approximately 8 feet wide and about 22 feet long. Larger units with tandem

axles can be built to special order.

The floor plan can be varied to suit individual requirements. Furnishings such as chests of drawers, desk tops, drafting boards, wardrobes, oil-burning heat stoves, etc., are factory-installed. The standard-size trailer contains ample deck room for three or four men, in addition to working and storage space.

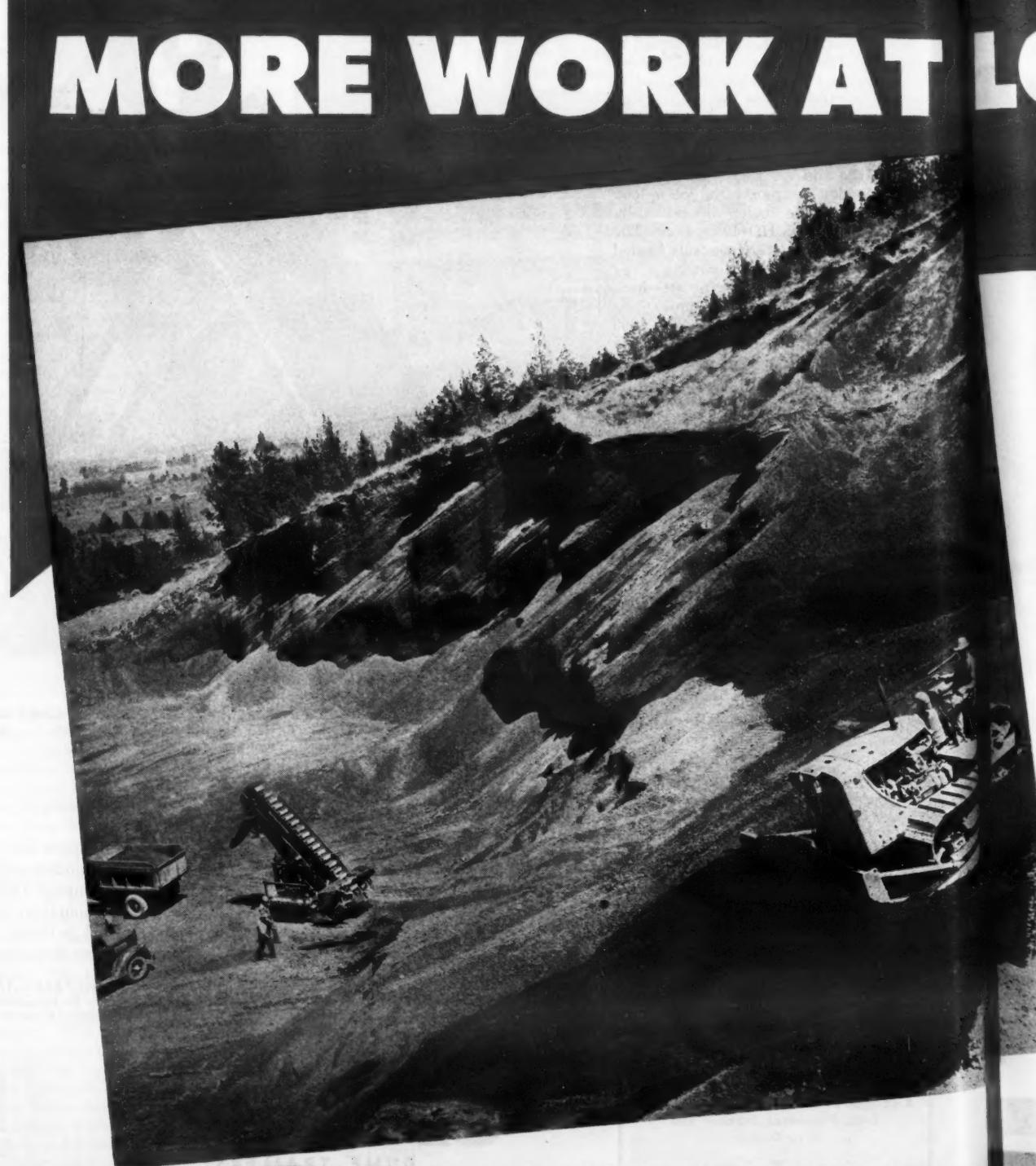
Further information may be secured

from the company. Or use the Request Card at page 16. Circle No. 58.

Six Gravel Crushing And Screening Plants

A folder describing six gravel crushing and screening plants manufactured by Gruendler Crusher & Pulverizer Co., 2915 N. Market St., St. Louis, Mo., has recently been made available. Rated capacities for the six plants range from 25 to 200 tons per hour. General specifications for each are included in the catalog, and a cross-section diagram and ten photographs of component parts illustrate their working mechanisms and features. Designed primarily for operation on gravel, these plants may also be used for rock production—either with a Gruendler portable primary, or in a stationary quarry operation to increase capacity of the secondary crushing equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 117.



TUNE IN . . .
TEXACO STAR THEATER
starring
MILTON BERLE
on television
every Tuesday night.
See newspaper for
time and station.



TEXACO

Four-Wheel Scraper Has 25-Yard Capacity

A new 24.5-cubic-yard Model 625 scraper has recently been engineered by the Findlay Division of Gar Wood Industries, Inc., Findlay, Ohio. This new 4-wheel cable-operated scraper has an open bowl and is designed for use with the Allis-Chalmers HD-19 tractor.

Positive forced ejection from the bowl is accomplished by a sliding end gate which is returned to digging position by heavy-duty springs. The cutting edge is bowed and of three-piece construction. End and center sections are reversible. The side cutting edges are bolted to the scraper. In rocky or rough going, a cutting-edge extension or frost bit is provided as optional equipment.

Other features of the Model 625 include a heavy-duty 8-inch ball-in-socket provided in the fifth wheel to maintain the strength required at this point and to give the flexibility needed; and an extra-wide heavy-duty pusher plate curved to accommodate the arc



Gar Wood's new Model 625 four-wheel scraper is designed for use with the Allis-Chalmers HD-19 tractor. It has a 24.5-cubic-yard capacity.

of a bulldozer blade. The pusher plate, incorporating a tow hook, is placed far beyond the tires so that the rear tires will not be damaged by the pusher tractor. Three tire options are offered to accommodate practically all types of digging conditions.

The gate opening is 78 inches wide. Apron arms are on the outside of the scraper to keep dirt from clogging the mechanism. All wheels are mounted on anti-friction tapered roller bearings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 111.

Rock Bits Appoints Bono

Tom Bono is filling the position of Sales Representative in the middle-Atlantic territory for the Rock Bit Sales & Service Co., Philadelphia, Pa. Before taking this job, Mr. Bono was with Gardner-Denver.

Air-Cooled Engines For 2 and 3-Hp Needs

Two new air-cooled engines, the Model K7-1 developing approximately 2 hp with a 7.07-cubic-inch displacement and the Model K12-1 developing approximately 3 hp with a 12.18-cubic-inch displacement, have been announced by the Kohler Co., Kohler, Wis. Compact and lightweight, these engines are designed for use on tractors, water pumps, concrete mixers, conveyors, rollers, compressors, mowers, sprayers, and other construction equipment.

Features include a counterbalanced forged-steel crankshaft operating on ball bearings, helical timing gears, moistureproof crankshaft magneto, mechanical oil-bathed flyweight governor, aluminum cylinder and crankcase with special cast-iron cylinder liner, aluminum cylinder head with large cooling area around valves, metered positive splash lubrication, and special carburetor to insure operation at angles up to 30 degrees.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 98.

An All-Wheel Drive Truck in Light Class

A light-duty four-wheel-drive truck has recently been introduced by the Four Wheel Drive Auto Co., of Clintonville, Wis. The new Model LD has a gross vehicle weight of 14,500 pounds. Up to now, 17,000 pounds has marked the beginning of the FWD range, which extends up to 58,000 pounds.

The new model has been designed for light-duty service requiring the added traction of four-wheel-drive design—a field previously served by conventional rear-drive trucks, some of which have been converted into four-wheel drives by independent firms. The new Model LD is designed for off-the-highway as well as on-the-road service.

Further information on this truck may be secured from the company. Or use the Request Card at page 16. Circle No. 87.

Bulletin on 16-E Paver

The rubber-tire-mounted Koehring 16-E Twinbatch paver is discussed in detail in a catalog recently issued by the Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis. The bulletin points out several features of the new machine: rubber-tired mobility at speeds of more than 6 mph; hydraulic power steering controlled from the operator's platform; a 60-degree elevating boom which provides for controlled bucket discharge up to a height of 21 feet; a fast-charging skip hoist and Autocycle timing for "split-second" mixing controlled by a Batchmeter. A special tower attachment and admixture meter are listed as optional equipment. Along with a comparative production and capacity chart, detailed dimensions and specifications are also listed.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 155.

Circular on Wheelbarrows

A circular describing six models of contractors' wheelbarrows has recently been issued by General Wheelbarrow Co., Inc., Wichita, Kans. It describes styles with struck capacities of 3, 3½, and 4 cubic feet, and points out that the Hi-Lift legs of these two models are designed to reduce the strain of lifting the barrow. Dimensions, specifications, and other features are included in the literature. Also covered are a brick and tile barrow and a mortar box.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 112.

LOWER COST—

Keep engines clean and efficient with TEXACO URSA OIL X**

SSURE trouble-free engine performance, and you'll get more work and longer working life from your machines. Maintenance costs and fuel consumption will be less, too. Use *Texaco Ursa Oil X***—the fully detergent and dispersive oil that cleans as it lubricates. Ideal for both heavy-duty gasoline and Diesel engines.

*Texaco Ursa Oil X*** strongly resists oxidation. This means rings stay free, valves act properly because engines are cleaner. *Texaco Ursa Oil X*** stands up under heat and pressure . . . gives full protection at all times . . . guards bearings against corrosion . . . assures longer life for moving parts.

Reduce Other Maintenance Costs

Use *Texaco Marfak* in chassis bearings—get extra hundreds of miles of protection, longer life for all chassis parts.

In wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, requires no seasonal change.

Protect crawler track mechanisms with *Texaco Track Roll Lubricant*. It's remarkably long lasting, seals mechanisms against

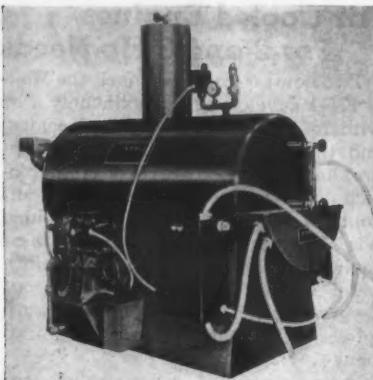
water and dirt, reduces wear.

Texaco has a Simplified Lubrication Plan that's a real money saver. Ask your *Texaco* Lubrication Engineer for full details. Just call the nearest of the more than 2,000 *Texaco* Wholesale Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT



Three sizes of the Siebring Electro-Matic steam boiler are available—40, 60, and 90 gallons, 1/10 to 10 hp.

New Steam Boiler Is Automatic, Electric

A new stationary, automatic, electric steam boiler for producing either small or moderate amounts of steam up to full 90-pound pressure has recently been developed by the Siebring Mfg. Co., George, Iowa. It can be used as a steam cleaner handling two cleaning nozzles, an auxiliary heat plant, or a steam generator for concrete curing.

Soundly constructed and completely automatic, the Siebring Electro-Matic steam boiler is made in strict accordance with ASME specifications for working pressures up to 150 pounds and will stand a 300-pound cold-water test, the company says. It is available in 40, 60, and 90-gallon sizes. Boiler horsepower depends upon the number of elements ordered, each element of 10 kw developing one boiler horsepower. The boilers are furnished in sizes from 1/10 to 10 hp.

Further information on this steam boiler may be secured from the company. Or use the Request Card at page 16. Circle No. 110.

Surveying Instruments

A series of circulars describing surveying instruments and contained in catalog form have recently been offered by Henry Wild Surveying Instrument Co., 26 Court St., Brooklyn, N. Y. Technical data are given concerning their precision construction, and their parts are indexed on a photograph.

The line presented in the catalog includes the small level, available with or without a horizontal circle; the precise level, with or without a horizontal circle; and the precision level, with an optical micrometer but without a horizontal circle. A folding leveling staff and a precise leveling staff graduated on Invar are offered. So are a compass theodolite, with or without a Barot micrometer; a double-center theodolite with optical centering; a universal theodolite with optical centering and electric illumination for circles and diaphragms; a precision theodolite for first and second-order triangulation; and a plane table outfit with box compass, level, slide rule, tangent table, horizontal scale rule, divider, magnifier, plumb bob, canvas-covered wooden case, and tripod with leather cap. A wide variety of accessory items for each instrument are offered, and a price list is included.

This literature may be obtained from



Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdy constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

Order from Your Equipment Distributor Today
THE SLOPE-METER CO.
MOUND, MINNESOTA

the company, or by using the Request Card at page 16. Circle No. 17.

For Tree and Brush Cutting

Tree trimming equipment and cutting shears for right-of-way clearance and maintenance work are the subject of the new Catalog No. 31 issued by the Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit 2, Mich. Items illustrated and described in the manual include, trimmers, pole and hand saws, splitting and felling wedges, saw files, load binders, wire cutters, safety belts and straps, axes, machetes, brush hooks, and sprayers.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 15.

White Heating Kettles Have Fire-Proof Tops

Cut-back and highly inflammable road repair material can be heated safely in White kettles. FIRE-PROOF top reduces fire hazard.

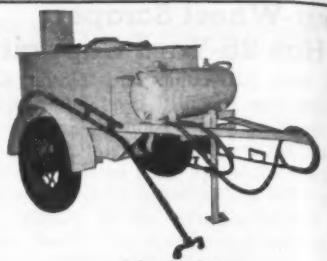
White asphalt and tar kettles are extensively used. They give long life and satisfaction.

Plain kettles or with hand or engine driven spray pumps for pavement patching. Thermometers, barrel hoist, warming hood extra. All oil burning. Springs, pneumatic tires. 65, 110, 220, 300-gallon capacities. Model F-10 is oil-jacketed to heat elastic joint filler.

White Mfg. Co.

ELKHART

INDIANA



Other Products

CONCRETE VIBRATORS

Gasoline Engine and

Electric Motor Driven Models

FRONT END LOADERS

for Industrial Tractors

ASPHALT PLANTS

Portable—Stationary

KEROSENE TORCHES

3 to 20-gallon Capacities

Write for Circulars

Another addition to the

the NEW

T'S-300

MOTOR WAGON

... Joins the LPC

Line of High Speed

Earthmoving Equipment



MODEL TS-300—A 14 to 17.5 cu. yd. high speed earthmoving powerhouse for the big tough jobs. Fast loading ability cuts seconds off loading time, makes possible an extra trip or two each hour. Positive forced ejection plus high apron lift assures complete ejection of the load on every trip.



MODEL TS-200—A 9 to 12 cu. yd. hydraulically controlled earthmover that is speedy, agile and powerful. It is small enough for small yardage odd jobs and utility work, yet has all the capacity and speed necessary for those long haul jobs.



LPC Motor Scrapers



LPC 6, 8 and 14 yd. Cable Scrapers

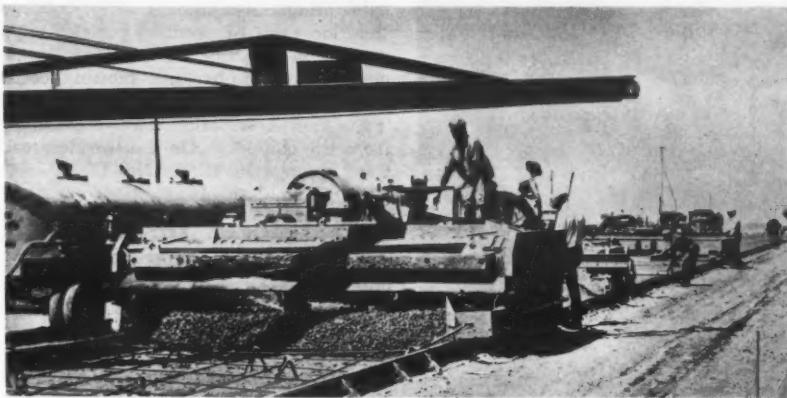


LPC 2 and 4 yd. Scrapers

Assembly-Line Style Of Paving in Canada

When Rosario and Dollard Brabant of Brabant Bros., Ltd., St. Boniface, Manitoba, Canada, bid a 13.7-mile portion of a 65-mile concrete paving project from Winnipeg to the Canadian-United States border, their first move was a trip to Chicago for information on the mass-production methods employed by Illinois operators in laying concrete pavement. They were quickly converted to assembly-line production and ordered a complete Blaw-Knox package of paving equipment.

The contract was awarded on May 10 and paving operations got under way on June 23 after Blaw-Knox steel road forms had been placed and the sub-



Brabant Bros., Manitoba contractor, used a MultiFoote 34-E DuoMix paver on its 13.7-mile contract near Winnipeg. A Blaw-Knox spreader distributed the 8-inch concrete in a single pass.

grade prepared by a B-K precision sub-grader operating on the forms. A MultiFoote 34-E DuoMix paver was used; the 8-inch concrete pavement was poured in a single pass and spread and compacted by a Blaw-Knox spreader-vibrator. The reinforcing mat, placed 4 inches below the top of the pavement, was supported on 3-legged metal chairs, which were removed just ahead of the spreader.

The pavement was finished with a Blaw-Knox finishing machine, hand belting to remove excess moisture, and a Koehring Longitudinal Finisher for the final finish. The best day's work was 3,240 feet of 12-foot pavement. The last slab of concrete was placed on September 8.

Improved Motor Oil

A new motor oil with a detergent additive designed to decrease wear and assure longer life has recently been announced by the Continental Oil Co., Ponca City, Okla. The additive compound in Conoco Super motor oil reduces rust, the company says, and acts as a foam depressant and anti-oxidant agent that lessens oxidation of the base oil.

The detergent additive, combined with Conoco's oil-plating, doubles the load-carrying capacity of the oil, the company says, and keeps road dirt and other contaminants in suspension so they can't build up on engine parts; this prevents such destructive materials from baking on engine surfaces, or causing rings to stick. Consequently, the company says, when the oil is changed, dirt is removed with the oil and the engines are kept clean. In 50,000-mile tests with 6 cars and 4 trucks, average wear on cylinders and crankshafts was less than 0.001 inch, the company reports.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 121.

Booklet on Wheel Tractors

A new booklet on wheel tractors has recently been prepared by the Oliver Corp., Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio. It includes specifications, cross-section drawings, and detailed engineering data on engines and transmissions. Presented in the catalog are the Oliver Models 66, 77, 88, and 900, with horsepower ratings of 26, 35, 45, and 63 respectively.

One section of the folder is devoted to the matched allied equipment available with the Oliver tractors: bucket loaders, maintainers, plows, mowers, backhoes, brooms, scrapers, and trenchers. Cutaway drawings with superimposed arrow lines point out features of the four different models. Optional equipment presented in the literature includes a direct-drive power take-off, wheel weights for heavy-load service, special exhaust mufflers, a Ridemaster seat, dual wheels for heavy-duty service, and rear-wheel guard extensions.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 151.

Rubber-Products Catalog

A catalog digest of industrial rubber products applicable for use in the construction industry has recently been issued by the Thermoid Co., of Trenton, N. J. Products listed in the digest include transmission belting, hose, V-belts, conveyor belting, and elevator belting. A brief description and illustration is given for each of the products. Over two dozen types of hose are presented—designed for air, welding, water, fuel, and steam applications. Dimensions and specifications for each are included.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 133.

The LAPLANT-CHOATE FAMILY



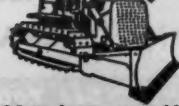
HERE'S the new job-tested and job-proved LPC TW-300 Motor Wagon—a hydraulically controlled bottom dump wagon flexibly joined to the same big rubber-tired tractor so popular on the TS-300 Motor Scraper.

Here again is the successful profit-making combination of big, rugged power (225 H.P.), big capacity (14 yd. struck, 19 heaped), high speed (21.2 MPH). Big 24.00 x 29 24-ply tires to carry the largest loads—Double-acting hydraulic steering and hydraulic door control for easy, effortless operation—Large 4-wheel air brakes, and a host of other features that make this unit outstanding in its field.

LAPLANT CHOATE



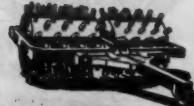
LPC TW-300 Motor Wagon



LPC Hydraulic or Cable Operated Dozers

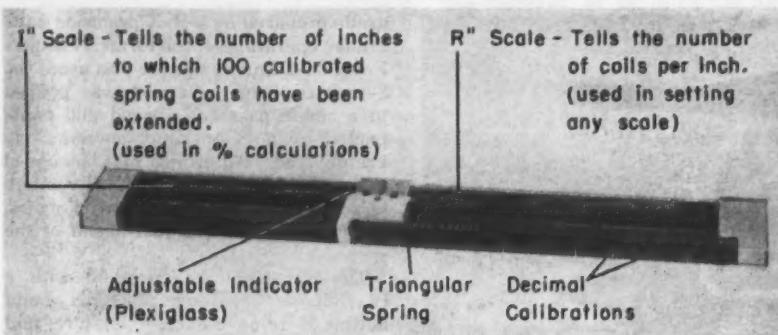


LPC Rippers



LPC Tamper

FAMOUS
LaPLANT-CHOATE
DOZERS—both angling
and straight blade—are
again available in either
hydraulic or cable-oper-
ated types. See your
LPC distributor
NOW!



Contractors and engineers can save many hours in solving graphic problems with the new H. J. Gerber variable scale.

The Variable Scale, A Remarkable Device

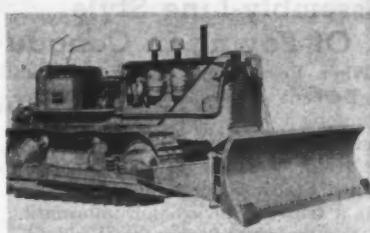
Probably few men who have ever laid hand to a pencil and scale on a drafting board haven't at one time or another wished for a rubber ruler—a ruler that could be stretched, thereby providing a flexible scale ratio for spacing rivets, for reading odd scales with non-dimensioned curves, for interpolation along a scale or between a family of curves, for calibrating instruments, or doing odd-scale drawing reproductions and the like.

An instrument to meet this need has recently been designed by H. J. Gerber, President of the newly formed Gerber Scientific Instrument Co., 89 Spruce St., Hartford 1, Conn. The Gerber variable scale, related more closely to a standard engineers' scale than to a slide rule, replaces both in some operations, and is specifically designed for solving graphic problems quickly and accurately.

The simple and precise construction of the instrument features a triangular spring, fixed at the left end and attached at the right to a slide which is marked with a hairline. This hairline is used to position the spring with respect to two scales, the I-scale (or percentage scale), and the R-scale (or reciprocal scale). For convenience in reading, every tenth coil of the 100-coil spring is red, and the half-way coils between the red ones are green. The fiftieth coil has a yellow dot. The numbers on the R-scale are analogous to those on the familiar triangular engineers' scale, and anyone who has turned from the 40 to the 50 scale and back, wishing there were one between, is someone for whom this instrument has been designed.

calibrating instruments, determining the location of centers of gravity, analyzing indicator cards, interpreting aerial photographs, and plotting contours.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 127.



Southwest Welding & Mfg. Co. has a new line of Type G bulldozers and trail-builders with the overhead A-frame eliminated.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 21.

Shell Joins Harnischfeger

Kentner W. Shell has joined the Harnischfeger Corp., Milwaukee, Wis. as Assistant Sales Manager of the Soil Stabilizer Division. This position was formerly held by Robert Graff who was recently transferred to Dallas.

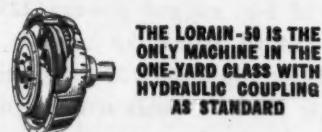
4 Crawlers for the LORAIN-50

SELECT FROM THESE 4 CRAWLERS
TO BEST FIT YOUR
TRAVEL AND DIGGING CONDITIONS



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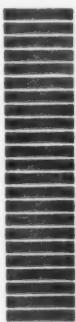
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Paving the 2-Mile Mystic River Bridge

Simple Form Work, Pump-Line Concrete, and Power Buggies Speed Pours on Boston Span

By WILLIAM H. QUIRK,
Eastern Editor

CONSTRUCTION of a 7 1/4-inch reinforced-concrete deck slab on the 2-mile Mystic River Bridge in metropolitan Boston was speeded with simply designed and easily assembled wooden forms, together with the use of a Pumpcrete machine and power buggies for placing concrete within the forms.

This part of the \$27,000,000 high-level-span project between Charlestown and Chelsea, Mass., was awarded by the Mystic River Bridge Authority to the Merritt-Chapman & Scott Corp. of New London, Conn. The deck paving was divided into three contracts totaling \$3,003,400. The same contracting firm also had the principal substructure contract on the project, which included the construction of the three river piers for the main channel span over the Mystic River. (See C. & E. M., June, 1949, pg. 2.) The structure also spans the Little Mystic Channel. Work on the long vehicular bridge started in March, 1948; it was opened February 27, 1950.

The 11,700-foot double-deck toll bridge provides three traffic lanes for traffic in each direction: the northbound traffic on the lower deck, and the south-bound on the upper. The roadways are 36 feet wide between curbs. A toll plaza tower was erected between the two overwater spans in the yard of the Boston & Maine Railroad. Its top is 140 feet above the ground, and each level is wide enough to accommodate seven toll lanes. The minimum vertical roadway clearance on each level, both at the plaza and throughout the bridge, is 16 feet.

The major unit of the superstructure over the Mystic River is a three-span through-truss cantilever bridge, 1,524 feet 2 inches long. Its Warren-type trusses are on 45-foot centers. Over the Little Mystic Channel, the bridge is a single, simple double-deck through-truss span, 439 feet 2 inches long. The approaches to the river and channel spans, and to the toll tower, consist of double-deck plate girders supported for the most part on steel bents. The structure is designed for H2O-S16 loading according to AASHO standards of 1944. Individual approach ramps to the bridge are 20 feet wide, curb to curb. The maximum grade, 3.6 per cent, is at the Charlestown, or south end.

Transit-Mix Concrete Throughout

Erection of the steel superstructure was broken down into four contracts, and the first section to get under way started at the toll plaza tower and continued south across the Little Mystic Channel. To pave this portion of the bridge, Merritt-Chapman & Scott Corp. set up a concrete hoist tower near pier S1, the south pier of the truss span over the Little Mystic Channel. The 160-foot steel tower had dual elevator platforms, one for men and materials and the other for concrete. A Chicago boom at the top also lifted construction materials to deck level. The platforms were raised by a Hercules-powered Mead-Morrison 3-drum hoist.

Transit-mix concrete was used throughout the deck pours. It was supplied by the Boston Sand & Gravel Co. from its Cambridge and East Boston plants, only 15 to 20 minutes travel time from the job site. As many as 8 truck-mixers, holding 4 1/2 cubic yards each, delivered concrete to the job. At

the bottom of the tower the trucks discharged their loads into a 3 1/2-yard hopper that fed into a 1 1/4-yard hoisting bucket sitting on the elevator platform. The platform was raised in the tower to a point above the bottom deck on which a dual 8-inch Rex Pumpcrete machine had been set up. The bucket was tripped, automatically chuting the concrete into the machine mixer. It was then pumped through an 8-inch line to the forms.

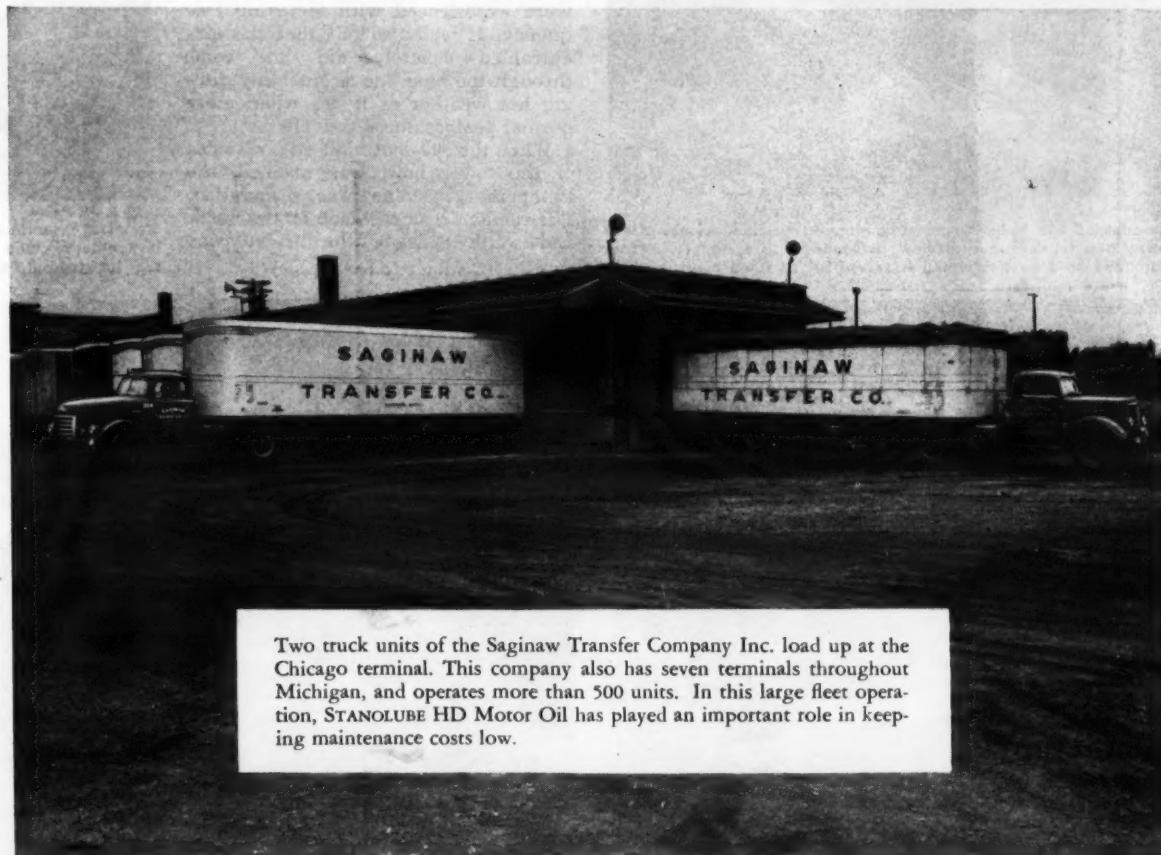
The bottom deck was paved first, then the upper. The Pumpcrete was kept in its original position on the lower level, with the discharge line making a big loop as it left the unit to reach the upper deck. In this manner the bridge deck on both levels was paved for a

(Continued on next page)



C. & E. M. Photo

You're looking north along the east side of the Mystic River Bridge in metropolitan Boston. Notice the concrete-hoisting tower at the south pier of the truss span over the Little Mystic River.



Two truck units of the Saginaw Transfer Company Inc. load up at the Chicago terminal. This company also has seven terminals throughout Michigan, and operates more than 500 units. In this large fleet operation, STANOLUBE HD Motor Oil has played an important role in keeping maintenance costs low.

Saginaw Transfer Company reports lower costs with...

• In the last five years, over 500 fleet units of the Saginaw Transfer Company Inc. travelled more than 150 million miles. That vast operation backs up the following report on STANOLUBE HD Motor Oil:

"We have used this excellent heavy-duty lubricant in gas and Diesel units. Clean engines, absence of crankcase sludge, and increased engine life have all been factors in reducing our maintenance costs," writes Manager Hale F. Lemmer. "The fine performance of STANOLUBE HD Motor Oil in our fleet has assured us of the dependability of this product."

You can rely on the experience of this fleet operator. It indicates the savings you can make with STANOLUBE HD Motor Oil. Your engines will stay clean, free from corrosion, and protected against wear. You'll have fewer overhauls jobs.

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Motor Oil

You can rely, too, on the experience and special training of a Standard Oil Automotive Engineer. His services can be obtained quickly and easily. Call on him to help you with preventive-maintenance problems. Phone the nearest Standard Oil (Indiana) office, or drop a card to: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA)

STANDARD

Paving the 2-Mile Mystic River Bridge

(Continued from preceding page)

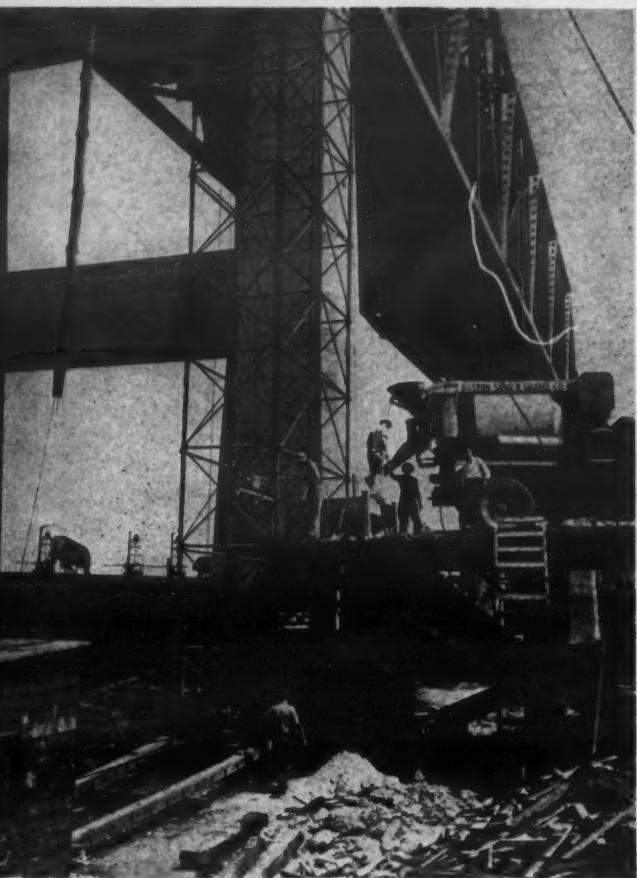
distance of 800 feet on both sides of the pump. The pipe line was carried over the deck forms on wooden horses. A washout line extended from deck level nearly to the ground to carry off the water used in washing out the machine and discharge pipe. On this section, water for the clean-up operations and curing was obtained from the B. & M. Railroad yards at the toll plaza tower. A Jaeger 4-inch centrifugal pump was used as a booster on a 1½-inch line to lift the water to the high level of the bridge.

Power Buggies

Although the Pumpcrete unit had a 60-yard-per-hour capacity, it was never operated beyond a 35-yard-per-hour limit, the average rate at which the deck crew placed and finished the slab concrete. This phase of the operations was done during the hot 1949 summer when 90-degree or better temperatures were experienced with annoying frequency. It was also felt that the air-entrained concrete did not come through the pipe line as smoothly during hot weather as it did when more normal temperatures prevailed.

When the 800-foot limit on both sides of the tower hoist was reached, the Pumpcrete machine was dismantled. The remainder of the deck on the north and south ends of the bridge was

(Continued on next page)



C. & E. M. Photo

At the foot of the hoist tower near pier 51 of the Mystic River Bridge, a Rex truck-mixer discharges concrete to a hopper. From there it flows to a bucket which is raised to the deck being poured.



C. & E. M. Photo

Merritt-Chapman & Scott set up its Rex Pumpcrete on the lower bridge deck. The concrete hoist tower and chute are at left. In the foreground, the 8-inch pipe line loops to the upper deck.



C. & E. M. Photo

An upright jack or leg for supporting the plywood form panels is fitted onto the lower flanges of the steel deck beams.



C. & E. M. Photo

Here a plywood form panel is about to be set in place on the uprights.



C. & E. M. Photo

As concrete flows over the steel and into the forms from the Pumpcrete line, two Mall vibrators go to work on it.



C. & E. M. Photo

A master vibrator screed then makes two passes over the freshly placed concrete. It is pulled along over the wooden side forms by crew members.



C. & E. M. Photo

Finally, deck forms are stripped from a platform hung below this deck and suspended from a carriage called "The Swoose," which rolls along the deck under its own power.

C. & E. M. Photo

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C. & E. M. Photo
When not hauling concrete, the Moto-Bugs were often used to move form panels. Each of the buggies has a 10-cubic-foot capacity.

poured by placing the concrete with a fleet of 12 Kwik-Mix Moto-Bugs, power buggies with 10-cubic-foot capacities. Paving on the north side of the bridge was done first. Truck-mixers discharged their contents into 1-yard concrete buckets which were then lifted from the ground by a Link-Belt truck crane equipped with a 100-foot boom. The crane dumped the concrete into a 3½-yard hopper set up on the deck. The Moto-Bugs were then filled and rolled over runways to the forms. These little machines, each operated by one man, were also used for shifting materials such as forms around the job when they were not handling concrete.

As the superstructure steel erection moved along, the deck work kept pace. When the slabs adjoining the abutments were in place, the truck-mixers were run right up on the deck eliminating the need for the crane. They then emptied out either into the hopper or directly into the power buggies which conveyed the concrete to the forms.

Ingenious Forms

At the start of the job, the contractor bought 140,000 square feet of ½-inch plywood which was cut out into panels 2 feet 6 inches x 6 feet. They were cut to the 72-inch length so as to fit between the steel transverse floor beams of the bridge superstructure. The cross beams are spaced 77½ inches on centers, supported on the plate girders. Their uniform spacing permitted the continual re-use of the forms until they finally wore out.

Merritt-Chapman & Scott Corp. developed a forming system that was economical to build, simple to install and dismantle, and required no wiring, hangers, or holes to be drilled. The plywood panels fitted directly under the top flanges of two parallel cross beams, and were supported on jacks or legs placed on 15-inch centers along the lower flanges of the steel beams. Wedges were driven between the lower flange and the bot-

tom of the jacks, forcing the plywood tight against the upper flange.

These wooden supporting cross



C. & E. M. Photo
This Mall vibrator fitted with a Craftsman table saw could be moved around the deck wherever it was needed for form work.

members, simple to construct, were 2 x 4 vertical legs at the ends. The carpenters assembling these supports

(Continued on next page)

Greater Capacity-Lower Operating Costs



9-B TELSMITH Dual PORTABLE (above) with field conveyor and hopper, owned by Lyle J. Walker and operating near New Hudson, Michigan.

NEW 7-A TELSMITH Dual PORTABLE (right) with plant hopper, owned and operated by Tri-County Sand & Gravel Co., Pulaski, Wis.



Check these Telsmith advantages—

1. Greater Capacity because of 25% larger screen areas; and 25% larger capacity of rotary elevator with improved overhead drive.
2. Improved Transmission Equipment—(a) all main sprockets are now high carbon, heat treated steel; (b) all bearings are anti-friction type; (c) larger capacity, improved type Twin Disc Clutches with fully enclosed anti-friction shifting collars.
3. Easier Accessibility for adjustment and repair, with a minimum of under-chassis work needed.
4. Improved Control mechanism for easy operation.
5. Abrasion Resisting Steel of higher quality, at all points subject to wear.
6. Larger Under-Screen Hopper with steeper sides and easily accessible clean-out door.
7. Improved Larger-Capacity Receiving Hopper and feeding mechanism—with removable grizzly.
8. Six Adjustable Jacks are standard equipment on the new Model 9-C Dual Portable Plant.

Now Made in Two Popular Sizes

9-C Dual—with 10-in. x 36-in. jaw crusher, 30-in. x 18-in. rolls, and 4-ft. x 10-ft. 2½-deck screen.

NEW 7-A Dual—with 10-in. x 30-in. jaw crusher, 24-in. x 16-in. rolls, and 4-ft. x 8-ft. 2½-deck screen.

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P-16

SMITH ENGINEERING WORKS, 4014 N. HOLTON ST., MILWAUKEE 12, WISCONSIN



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Paving the 2-Mile Mystic River Bridge

(Continued from preceding page)

also started a nail into each upright near the base. After the wedge was driven, the nail was hammered in further to prevent the wedge from slipping out.

Only two carpenters were needed to set the forms in place. One worked from the already completed deck, and the other sat astride the exposed paralleling floor beam. During the hot weather an insulating cushion over the steel was a must. The two jacks, supporting each panel, were set in place on the lower flanges of the beams. Then the plywood form was laid on top. Next the carpenters reached under the panel to drive the wedges and secure them in place with the nail. A few nails were also driven through the plywood into the jacks. The farthest the carpenters had to reach under was 15 inches, the spacing of the jacks. The form was then in place, fitting tightly against the upper flanges of the beams. This simple procedure was followed across the bridge from one side to the other.

The carpentry work was done chiefly with hand tools, and with a small power saw converted by fitting out a Mall vibrator with a Craftsman 8-inch table saw. Only two bolts were required to attach the saw to the vibrator. The unit was assembled in 10 minutes, and was wheeled handily around the deck to wherever it was needed.

Concrete Placing

When the forms were in place the plywood was oiled and then covered with a double mat of reinforcing steel which was furnished by the Bethlehem Steel Co. from its Cambridge, Mass., plant. It was delivered to the job by truck. The concrete was laid for the full 36-foot-roadway width and vibrated as it was placed, by a couple of Mall vibrators. A Master vibrator screed then made two passes over the freshly placed concrete, being pulled along by manpower over the wooden side forms. At the toll plaza, two 36-foot lanes were poured and finished with a Flex-Plane machine, while the adjoining flare work was done by hand.

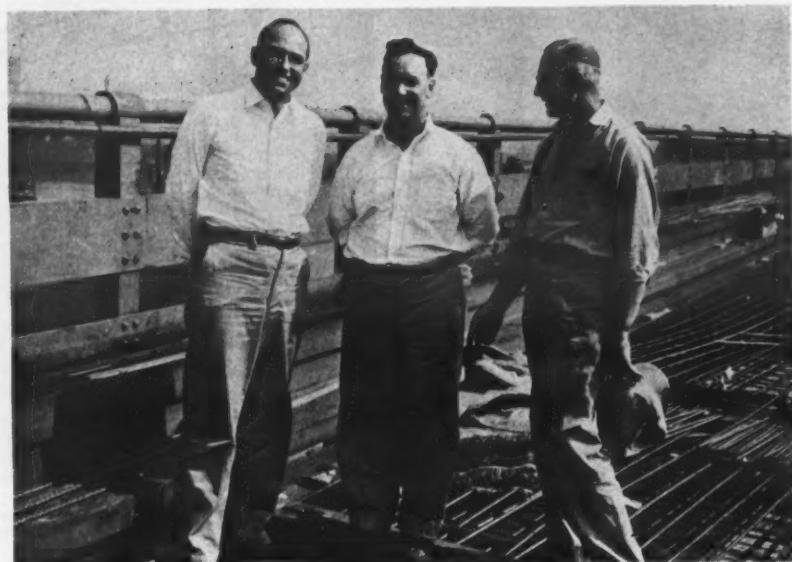
After the vibrating screed had passed, the surface of the concrete was checked with a long-handle float consisting of a 1 x 6, 4 feet long. It was then floated longitudinally with a Cleveland bullfloat made with a 10-inch channel 16 feet long and operated from a four-wheel bridge. A burlap drag, 42 inches long, was pulled over the concrete from another float to remove excess moisture. The surface was next broomed with a fiber bristle broom and covered with jute mats which were wet down and kept on for 25 hours. After the mats were removed the concrete was sprayed with a curing compound; both Sealcoat and Klearcure were used at different times. For the ends of the bridge, water was obtained from city hydrants and carried in pipe lines to where it was needed.

Once the job got organized, which took but a short time, concrete was placed nearly every day by judiciously shifting the forms about from bent to bent for alternate pours in different parts of the bridge. The first slab was poured on June 1, 1949, and thereafter the paving kept up with the steel erection. The concrete deck was completed by the end of the year.

The dry weights of a 1-yard batch of concrete were as follows:

Cement	611 lbs.
Sand	991 lbs.
Gravel	2,106 lbs.
Water	27½ gals.

At the central batch plant 22 ounces of Drexel was added to every yard of



C. & E. M. Photo
Personnel on the Mystic River Bridge job: Resident Engineer Marshal McCord (left), Superintendent Harold Jenkins (center), and Inspector Bob Chapman.

concrete to give an air content of 4½ per cent, plus or minus 1½ per cent. The concrete had an average 3-inch slump. The gradation of the fine and coarse aggregate used in the mix was as follows:

Sieve Size	Per Cent Passing	
	Gravel	Sand
1½-inch	100	...
1-inch	90-100	...
½-inch	25-60	...
¼-inch	...	100
No. 4	0-10	95-100
No. 16	...	45-50
No. 30	...	10-30
No. 100	...	0-8

Form Stripping

Deck forms were placed from above and stripped from below. Upper deck forms, for the most part, were removed by setting Patent Scaffolding up on the lower deck. The nails in the wedges were pulled, then the wedges were knocked out, and the entire plywood panel with supporting jacks was lifted down from between the cross beams.

For removing forms from the lower

(Concluded on next page)

PAYLOADERS



FIVE PROVEN MODELS

12 cu. ft. • ½ yd. • ¾ yd. • 1½ yd. • 1½ yd.



deck, a stripping platform was hung beneath the bridge. The platform was built of two 4-foot-deep steel trusses, 52 feet long, placed 13 feet apart on centers with a wooden floor between, supported from the top of the trusses. The platform was suspended from a carriage that rolled along over the lower roadway deck under its own power. On the side of this carriage someone had playfully written "This Is the Swoose", and the name seems to be as good as any for labeling a machine that was made up on the job to fit a specific purpose.

The Swoose had a structural-steel framework that moved along on eight rubber-tired wheels, four to a side. It was 34 feet wide, out to out of wheels, so fitted neatly within the bridge roadway. It was anchored in place by a cable fastened to a bridge member on each side, and pulled itself along with a Clyde 2-drum gas-driven hoist mounted on the framework. Extending out from each side was a steel beam to which the stripping platform was at-

tached by two pairs of $\frac{3}{8}$ -inch cable, one pair on a side. The platform was raised or lowered by means of the cable and hoist. For added safety, other cables were attached from the platform to the bridge when the men were stripping forms.

When the forms were stripped from one span, the platform was lowered to the ground or barge, the cables were unhooked at one end, and the platform was then pulled around the bent or pier. The cables were replaced, and the platform was again raised into position so that the forms could be stripped from the adjoining span. The ingenious device was built right out on the deck inside of three days, and could be dismantled in a matter of hours. A move along the roadway from one section of deck forms to another was done in five minutes.

Quantities and Personnel

The major items in the paving contract on the bridge superstructure totaled:

Roadway paving concrete 15,920 cu. yds.
Reinforcing steel 4,600,000 lbs.

Merritt-Chapman & Scott Corp. was represented on the Mystic River Bridge superstructure paving contract by Harold Jenkins, Superintendent. Charles A. Richardson was Project Manager; A. M. Heaton is District Manager for the contracting firm.

Marshal McCord was Resident Engineer for the J. E. Greiner Co. of Baltimore, Md., the consulting engineers who designed the entire structure and are supervising the construction.

The Mystic River Bridge Authority is headed by Ephraim A. Brest, Chairman; Edmund E. Capodilupo is Secretary-Treasurer.

For Alloy Firm in N. California

Factory representative for Mir-O-Col Alloy Co. in northern California is now Col. Harry T. Hanover, with offices at 449 Bryant St., San Francisco. Mir-O-Col makes hard-facing rods, automatic wire, and special castings.



A right-angle-drive attachment and three speeds from 300 to 675 rpm are features of the Tri-Speed S-412 drill.

Right-Angle-Drive

Three-Speed Drill

Three job-determined drilling speeds can be obtained with the new portable right-angle-drive power unit developed by the Milwaukee Electric Tool Corp., 5316 W. State St., Milwaukee 8, Wis. Weighing 8 pounds, the new drill is designed for work in hard-to-get-at places.

The $\frac{1}{2}$ -inch Tri-Speed S-412 drill offers speeds ranging from 300 to 675 rpm, and works in wood, ceramic, concrete, stone composition, and sheet-metal materials. Variable speeds make it suitable for polishing marble and stone. Either high-speed carbon-steel or carbide bits can be used.

The right-angle-drive attachment permits drilling between 12-inch center joists and studs, and in close or obstructed places. As an added safety and convenience feature, the handle can be removed if desired or adjusted around its 360-degree range for either right or left-hand operation.

Powered by a $\frac{1}{2}$ -hp universal ac or dc motor housed in an aluminum case, the unit can be operated at 115 volts, zero to 60 cycles. Special voltage can also be obtained. A die-cast turbine fan provides controlled cooling; a triple gear train provides high torque; and anti-friction ball and needle bearings provide alignment and retain grease. The chuck is interchangeable and can be detached from the drill and inserted on the adapter when using right-angle drive. Through standardization, the angle drive can be adapted to six models of Milwaukee drills to obtain speed ranges from 100 to 3,000 rpm.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 33.

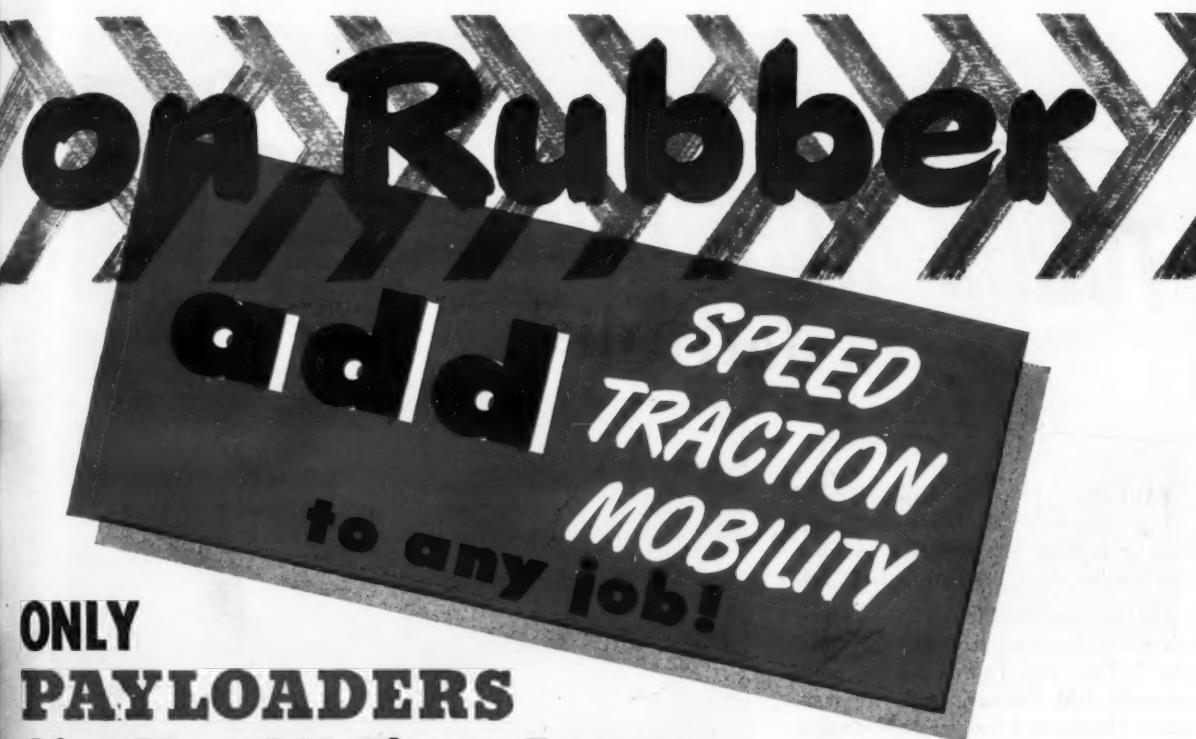
Concrete Piles, Caissons

A 12-page folder describing Western concrete piles and caissons has recently been prepared by the Western Foundation Corp., 2 Park Ave., New York 16, N. Y. The folder points out that Western Foundation services include—in addition to furnishing and placing piles and drilled-in caissons—exploration, engineering, consultation, and pile test programs. Illustrations and text describe the various piles placed by the company: button-bottom, pedestal, compressed concrete, caisson, projectile, composite wood, driven-core composite, and steel H and pipe piles.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 103.

In New England for Onan

Howard Dahl is now Direct Factory Sales Representative in the New England states and New York for D. W. Onan & Sons, Inc., Minneapolis, manufacturer of electric generating plants. He maintains headquarters at Sea Bright, N. J., but spends most of his time in the field.



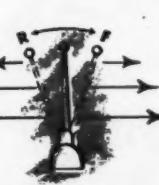
ONLY PAYLOADERS Give You All These Features

COMPLETE UNITS—NOT TRACTOR ATTACHMENTS

Payloaders are complete Hough-built tractors-with-shovels designed expressly to provide faster, more efficient and more versatile tractor-shovel performance. They dig, load trucks, grade, level, spread and backfill... also handle bulk materials, push, pull and lift.

SEVERAL SPEEDS—BOTH WAYS QUICK FORWARD-REVERSE SHIFT

Transmissions are fully reversing... have several speeds in reverse as well as forward... PLUS a separate, quick-acting, forward-reverse selector. They outperform all regular tractors having only one slow reverse speed.



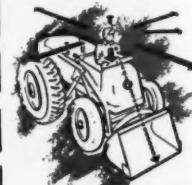
DOUBLE CUTTING ACTION AND LEVEL CARRYING OF FULL LOADS

Bucket digging action is a powerful forward-upward cutting action that gets full loads independent of tractor forward motion. Bucket then tips back quickly so that heaped loads can be carried low without spilling.



CONTROLLED POWER DUMPING AND BUCKET CLOSING

Fingertip controlled hydraulic power dumps bucket as abruptly or slowly as desired, also closes the bucket. Saves wear and tear on truck bodies and springs... speeds loading cycles.

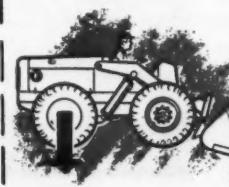


OPERATOR COMFORT—VISIBILITY

Operator is comfortably seated high and forward where he can see what he's doing and where he's going at all times. No superstructures to obstruct his vision.

COMPACT, STABLE, MANEUVERABLE

Rear engine location counter-balances the load... increases machine stability and capacity. Short wheelbase, low center of gravity and hydraulic brakes add to maneuverability, safety and ease of control.

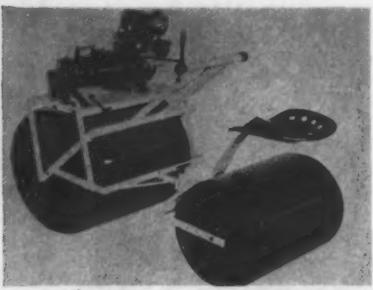


HOUGH PAYLOADER

Manufactured by THE FRANK G. HOUGH CO.



Write: THE FRANK G. HOUGH CO. 762 Sunnyside Avenue, Libertyville, Illinois



This small-sized general-purpose Motoroller has been developed by Gabb Mfg. Co. for roadside, landscape, and road-patching work.

A Half-Ton Roller For Light-Duty Jobs

The Motoroller, a general-purpose power roller adaptable to light-duty roadside development, landscape, and patching work, is announced by the Gabb Mfg. Co., 16 Orchard St., East Hartford 8, Conn. The new Series AR incorporates a heavy-duty combination reverse gear and forward clutch assembly, designed for constant operation in either forward or reverse. It is of the water-ballast type which facilitates transportation from one job to another and also permits a variance of weight. The tandem model weighs a little less than $\frac{1}{2}$ ton when loaded.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 43.

Packaged Compressor For Large-Size Jobs

A new design has been incorporated in a line of packaged heavy-duty electric-driven air compressors announced by Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. Sizes range from 125 to 350 hp for continuous full-load service and two-stage compression to 80-125-psi discharge pressures. The XLE is for use on large construction jobs and wherever skid-mounting or ground conditions require a well balanced machine, the company says.

The new design embodies a single vertical low-pressure compressor cylinder, a horizontal high-pressure cylinder, and a synchronous motor mounted directly on the crankshaft. Air enters and leaves the compressor through main air connections on the frame, instead of on cylinders, and is led to and from both cylinders and intercooler through large passages within the frame itself. There is no interstage piping or cylinder strain due to the air piping. The intercooler is of a packaged design and fits entirely within the frame.

Counterflow tube-and-finned construction of the intercooler is said to provide cooling with very little pressure loss and a small quantity of water. The intercooler is made of all-copper alloy throughout. Valves are of the I-R channel-valve type, with new design modifications. All bearings are full-floating and rotate freely both on the bearing journal and within the rod or bearing housing. They are combined with pressure lubrication in a sealed dust-tight crankcase that need not be opened for bearing adjustment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 138.

For Elevating and Conveying

An 8-page catalog presenting a full line of machinery for elevating and conveying materials has recently been offered by Brady Conveyors Corp., 20 W. Jackson Blvd., Chicago, Ill. It describes and illustrates both mechanical and pneumatic systems for conveying gravel, sand, cement, and other bulk materials.

Equipment manufactured by the com-

pany includes reciprocating plate feeders, apron feeders, dump hoppers and gratings, bucket elevators, elevator castings, screw conveyors, gravity-discharge elevators, flight conveyors, bunkers and bins, pivoted bucket conveyors, belt conveyors, belt-conveyor trippers, skip hoists, automatic loaders, and pneumatic conveyors.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 150.

C.I.A.C. Elects Chairman

Carlton S. Proctor, New York consulting engineer, has been elected chairman of the Construction Industry Advisory Council for the year 1950-51, the Chamber of Commerce of the United States has announced. Mr. Proctor is a member of the firm of Moran, Proctor, Freeman & Mueser and a former Vice President and Director of the American Society of Civil Engineers. He succeeds James R. Edmunds, Jr., as chairman of the C.I.A.C.

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TRUCK MIXER

Revolutionary Truck Mixer Design

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CONCRETE TRANSPORT MIXER CO.
4984 Fyler Avenue, St. Louis 9, Missouri

TOUGH MOUNTAIN HAULS ...a daily dish

HAULING 10½ bank yard loads of granite over mountain trails at altitudes up to 8300 feet is a real test of a Diesel engine's brute strength and stamina.

To see how General Motors Diesels take such work in stride, look at the record three LeTourneau Tournarockers, powered with GM Diesels, made for contractors Horner and Switzer on relocation of United States Highway 280 at Granby Dam, Colorado.

Checked on a haul of 1240 feet each way, including a 170-foot stretch of 13% adverse grade, each Tournarocker took only 4½ minutes to travel, dump and return to shovel. Haul road conditions were poor due to heavy rainfall. Yet haul cycles were so fast that on most distances only two of the Tournarockers were needed to keep the 2½-yard rock shovel busy. Together, these three 16-ton units moved 220,000 yards of granite.

Here is self-evident recommendation of GM Diesel's powerful 2-cycle operation — power at every piston downstroke. It makes them compact, easy to start, quick on the pickup, clean burning and efficient at any altitude.

If you're interested in dependable power with rugged performance and low fuel costs, you'll want all the details about GM Diesels. See your distributor or drop us a line.



DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . . . Up to 275 H.P. DETROIT 28, MICHIGAN MULTIPLE UNITS . . . Up to 800 H.P.

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK



Levee Is Built Near New Orleans

Four Dredges Pump Hydraulic
Fill Between Dikes Throw Up
By Draglines Along Shore of
Lake Pontchartrain

JEFFERSON Parish, Louisiana, just west of New Orleans, is now protected on its northern boundary from any floods that may come sweeping in from the broad expanse of Lake Pontchartrain. Recent storms and hurricanes in September, 1947, and again in March and September of 1948, blew the waters of the lake up over the land, breaking through the shallow levee along the shore front. The old earth embankment was of little value in protecting this narrow strip of land lying between two mighty bodies of water—the Mississippi River and Lake Pontchartrain.

The Department of the Army, Corps of Engineers, New Orleans District, undertook this Lake Pontchartrain, Jefferson Parish, levee work under general flood-control authorization wherein local interests furnish the right-of-way, share a portion of the construction costs, and operate and maintain the work after its completion. In this instance the Pontchartrain Levee Board is the cooperating local agency that assumes 25 per cent of the cost of construction, furnishes the right-of-way, and so forth.

Jefferson Parish, the term "parish" being synonymous with "county" in other states, is a narrow strip of land extending southward from the south shore of Lake Pontchartrain, across the Mississippi River, until it reaches Barataria Bay on the Gulf of Mexico. The flood protection discussed here covers the fourth drainage district of the parish, an area of some 30,000 acres lying between the river and the lake, with St. Charles Parish to the west, and Orleans Parish, which is the New Orleans city line, to the east. The latter boundary line corresponds to the 17th Street canal.

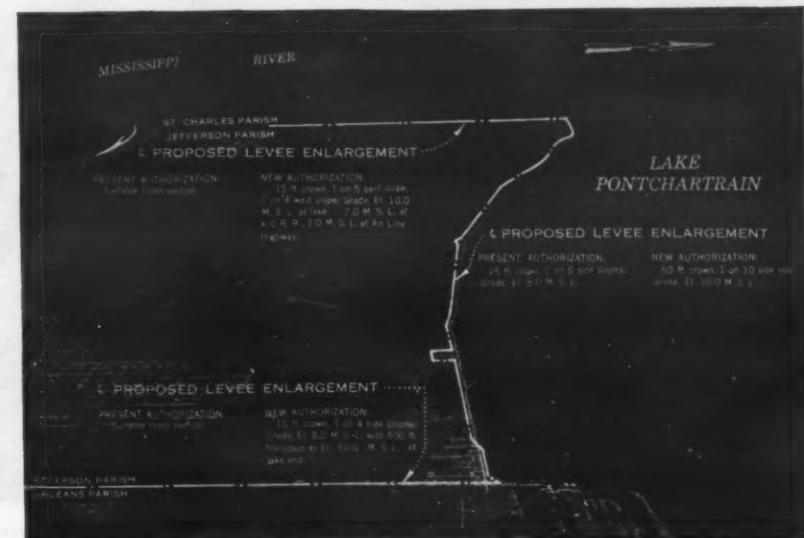
Important Protection

Across this segment of land goes the Airline Highway from New Orleans to Baton Rouge carrying U. S. 51, 61, and 65; the main line of the Illinois Central Railroad between New Orleans and Chicago; and the Louisiana & Arkansas, Missouri Pacific, Southern Pacific, and Texas and Pacific Railroads. Within this area lies the great Moisant International Airport, the WWL radio transmitter tower, industrial and commercial sites, and extensive residential communities. Roughly 20 per cent of the

total area is highland between the 5-foot contour and the natural levee of the Mississippi River which is generally at elevation of 12 to 15 feet MSL. There are also many acres of undeveloped swamp and marshy lowlands below the 5-foot contour, some of which is below mean sea level. The total area to be protected, including the lowlands, has been drained by an intricate system of canals leading to the pumping stations along the lake front.

Drainage is northward to the lake, for the ground elevation at the land-side toe of the Mississippi River levee along the south boundary of the district is slightly higher than the rest of the area. The big levee along the south gives full protection from the river. But on the north Lake Pontchartrain has been a constant threat. A shallow embankment for a road known as the Hammond-Lake Shore highway afforded scant protection. This road along the lake front was built with hydraulic fill back in 1922-1924 to form a levee

(Continued on next page)



Photograph by Corps of Engineers, U. S. Army

The levee construction which is the subject of this article will protect the northern boundary of Jefferson Parish, La., from any floods that may come sweeping in from the broad expanse of Lake Pontchartrain.



145-h.p. Series F-8 Big Job, with special tandem rear axle, one of over 175 Ford Economy Truck models, has an allowable G.V.W. rating as a six-wheeler of 35,000 lbs.

"We doubled tonnage...cut rock delivery costs about 33%" —SAYS H. B. GRAHAM, PUEBLO, COLORADO

"WHAT A TERRIFIC JOB our nine Ford F-8 Big Jobs are doing on the Pueblo to Canon City highway," reports H. B. Graham.

"We have doubled tonnage per day over our previous trucks. And you should see our drivers scramble for a Ford when a new one is delivered. They think the new Fords are the greatest things that ever happened in trucking. I share that opinion because we've cut rock delivery costs about 33%."

Ford trucks do more work! They're Bonus Built with big reserves of strength and power to handle big loads. Ford trucking costs less! Volume production know-how results in low original price. Truck engineering know-how keeps operating costs low.

See your Ford Dealer today! Choose from over 175 models ranging from 95-h.p. Pickups to 145-h.p. Big Jobs. G.V.W. ratings from 4,700 lbs. to 22,000 lbs. There's a Ford Truck to fit your job and your budget. And, remember, Ford Trucks "do more per dollar!"

SAVE WITH FORD!

AMERICA'S NO. 1 TRUCK VALUE!

★ **SAVE GAS** with Ford Loadomatic Ignition and High Turbulence combustion chambers.

★ **SAVE OIL** with Ford Flightlight aluminum alloy pistons. Cam ground for oil-saving fit at operating temperatures.

★ **SAVE WEAR** with pressure lubricated main and crankpin bearings. Double Channel frame, extra heavy duty axles, big brakes (up to 16-in. by 5-in.)

★ **SAVE ON REPAIRS** with demountable brake drums, brake inspection hole, engine-top setting of accessories, plus nationwide service from over 6,400 Ford Dealers.

★ **SAVE TIME** with Ford reliability and performance. The only eight-cylinder engines in trucking. Only Ford gives you a choice of V-8 or Six!

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Send me without charge or obligation, detail
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 LIGHT MODELS EXTRA HEAVY DUTY MODELS

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SPEED-UP CONSTRUCTION



The Danuser Digger Attachment for most popular tractor makes is built for rugged jobs. Digs holes fast, straight, automatic—500 to 600 per day. One-man operation—augers 4" to 24". Write Dept. D.
DANUSER MACHINE CO., Fulton, Mo.



The Danuser Digger Attachment for most popular tractor makes is built for rugged jobs. Digs holes fast, straight, automatic—500 to 600 per day. One-man operation—augers 4" to 24". Write Dept. D.
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Ford Trucking Costs Less Because—

FORD TRUCKS LAST LONGER

Using latest registration data on 6,592,000 trucks,
life insurance experts prove Ford Trucks last longer!

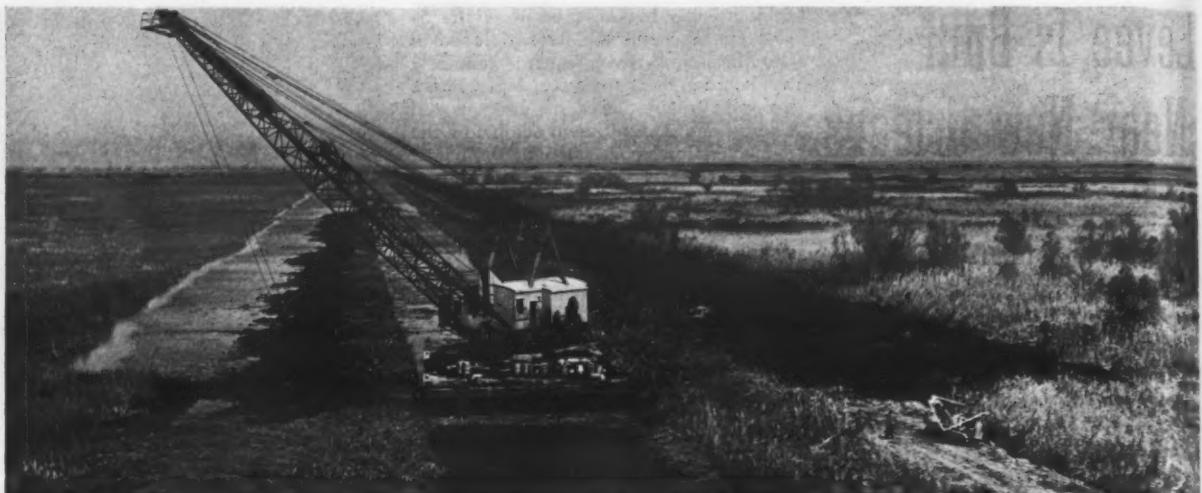
Levee Is Built Near New Orleans

(Continued from preceding page)

with a maximum height of 8 feet, a 25-foot crown, and 1 on 6 side slopes. This embankment had subsided to elevation 3 to 5 feet MSL by 1947.

During the 1947 and 1948 hurricanes this substandard levee was topped and crevassed in several places. Several long stretches were completely washed away. Parts of the drainage district were under 6 to 8 feet of water. Residents of the thickly settled Metairie section were forced to flee their homes. Traffic was disrupted, and the runways at the Moisant Airport were completely covered by the water. The shore road, unpaved and maintained by the parish, was left pretty much in a bad state of disrepair.

Even without a hurricane, the lake waters can cause trouble. Pontchartrain is wide but shallow, averaging 10 to 14 feet in depth, and is well known



Photograph by Corps of Engineers, U. S. Army
On the Villere Co. contract, Item A, a Bucyrus-Monighan walking dragline, mounted on a barge, builds uncompacted levee embankment.

for its sudden squalls and high seas. Only standard levees, well constructed with good height and cross section, are considered adequate protection to this important section of the parish.

Three-Item Project

The type of protection, as conceived and designed by the Corps of Engineers, consisted of three items—A, B, and C. Item A was at the west side of the project along the St. Charles Parish line. It included the construction of a levee section, nearly 5 miles long, from the Illinois Central railroad embankment on the south, northward to Lake Pontchartrain. Item B started at this point and continued in a general easterly direction to the Orleans Parish boundary. It paralleled the lake shore with the exception of three pumping-station locations where retaining dikes cut back to the structures. These stations pump drainage that is collected behind the levee into the lake; their modernization will be included in a future contract of the 4th Jefferson Drainage District. The levee enlargement included in Item B was slightly over 10 miles in length. Item C continued the improvement back from the lake for a little over 2 miles along the west bank of the 17th Street canal as far as pumping station 6 of New Orleans, and consisted of enlarging and raising an existing levee.

Item A in the Jefferson Parish Protection Levee contract was awarded by the Corps of Engineers to Walter P. Villere Co. of New Orleans on a low bid of \$126,616. It included 380,000 cubic yards of uncompacted fill at a unit price of 33.32 cents. Work started early in February, 1949, and was completed in August of that year despite a 30-day shutdown in April when the contractor's equipment was moved up the Mississippi to assist in the construction of an emergency closure dike when a crevasse occurred in the main river levee. The breach was located at Mulatto Levee in West Baton Rouge Parish on the right bank of the river above Port Allen, La.

A contract for Item B went to the McWilliams Dredging Co. at an estimated cost of \$1,085,520. The item covered 3,014,000 cubic yards of hydraulic fill at a unit price of 36 cents. The job got under way in December, 1948, and was completed by December 19, 1949.

Item C included 54,000 cubic yards of semi-compacted levee-enlargement fill which forms a roadway embankment along the canal, together with 4,000 yards of shell surfacing. Material for this section of levee enlargement was hauled 6 miles to the job from borrow pits near the Huey P. Long bridge. Work started in June, 1949, on Item C after a contract was awarded to E. A. Caldwell of Baton Rouge, La., on a low bid of \$1.148 per cubic yard.

of a small levee of varying cross section, having a 1 on 6 east slope, a 1 on 4 west slope, and a grade elevation of 15-foot crown,

(Continued on next page)



Here's Why
Crane Users
Save Money With

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TAGLINE CONTROL

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—steel tagline cable takes the load while protective slack is maintained in costly electric cable.

2. ON CLAM SHELL BUCKET JOBS—no swing, no sway. Saves time and improves efficiency.

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Large bearing and fewer sheaves reduce friction and wear.

Easy installation and easy switch to equipment of similar size.



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for its sudden squalls and high seas. Only standard levees, well constructed with good height and cross section, are considered adequate protection to this important section of the parish.

of a small levee of varying cross section, having a 1 on 6 east slope, a 1 on 4 west slope, and a grade elevation of 15-foot crown,

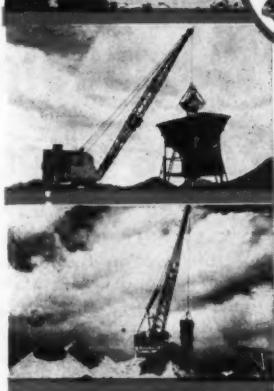
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1947 1948 1949 1950 Everything Points FORECAST

~~TO A BIGGER CONSTRUCTION YEAR
and MORE BOOMS with..~~

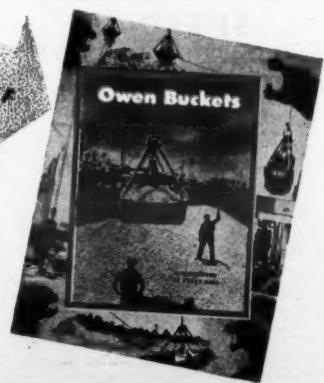
~~O'WEILLY will point~~

toward
NEW JOBS!



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7 feet MSL, net dimensions.

The new levee was built with a walker-type 200-W Bucyrus-Monighan dragline equipped with a 140-foot boom and a 6-yard bucket, and mounted on a barge. The rig cut its own flotation channel back from the lake front, and then enlarged the canal by taking out more material along the west side. The excavated material was cast up along the east bank to form the uncompacted levee embankment.

Lake-Front Levee

The new Item B 10-mile lake-front levee when complete will have a 25-foot crown, 1 on 6 side slopes, and a grade elevation of 8.0 net dimensions. It was constructed by pumping hydraulic fill, dredged from the lake, in between parallel dirt dikes thrown up by draglines. The McWilliams Dredging Co., the prime contractor, sublet the eastern half of its Item B project to Jahncke Service, Inc., also of New Orleans. The same method of building retaining dikes first and then filling in between was followed by both contractors. Dredging on both halves of the job got under way the latter part of April, 1949. Shaping of the fill to required dimensions will be accomplished by draglines under separate contract at a later date.

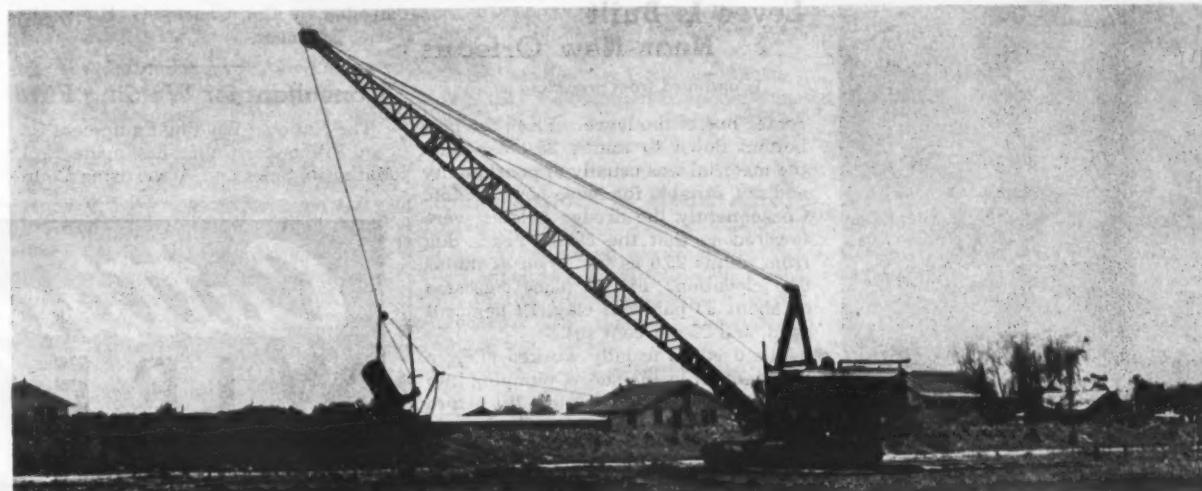
A right-of-way averaging 350 feet was provided for the new levee. The parallel retaining dikes were spaced from 150 to 190 feet apart, and were required to be 6 feet high before hydraulic fill was placed. For greater protection, the contractors strengthened the dikes by building them up to 7.5 elevation with a 10-foot crown. Draglines, working on timber mats, built the dikes with material skimmed out from the center. McWilliams sublet to Emanuel & Bean of Plaquemine, La., who employed a Link-Belt with an 80-foot boom and a 3-yard bucket, and a Lorain with a 50-foot boom and a 1-yard bucket. Dikes on the Jahncke end of the contract were built by a Northwest with an 80-foot boom and a 2½-yard bucket, and a Northwest with a 60-foot boom and a 1½-yard bucket. In each case the smaller rig was used on the lakeside dike.

To get enough material for the dikes, the draglines excavated to a minus 5.0 elevation. The top stratum was chiefly peat moss, with a blue gumbo clay underlying that. In places the peat went down to minus 10.0 elevation before a silty sand or clay was reached. The failure of the old levee was due in part to subsidence and wave action.

Hydraulic Dredging

The opening between the long, parallel rows of dikes was divided into 3,000 to 4,000-foot sections by transverse dirt dikes. In the lake side of each section a wooden sluice box, 20 feet wide, was constructed to permit the waste water from the hydraulic fill to run back into the lake. The bed of the sluices was set at plus 1.5 elevation. The initial lift of fill in each section averaged around 10 feet, building up from minus 5.0, the excavated center portion, to around plus 5.0. The final grade was reached with either two or three lifts.

Dredging for McWilliams was done with the 22-inch dredge Port Arthur at



C. & E. M. Photo

On the Jahncke subcontract, Item B, a Northwest 95, and a Hendrix bucket, builds retaining dike for hydraulic fill.

the start of the job. Later on the George A. McWilliams, a dredge with a 28-inch pump, and the dredge Vicks-

burg with a 16-inch pump, also went to work in the lake. Jahncke Service, the subcontractor, used the 22-inch

(Concluded on next page, Col. 2)

Plain Facts About

MANGANESE ELECTRODES

**Here's another instance
where you can't eat your cake
and have it too!**

If you demand the ultimate in sound, high-strength manganese weld deposits with no cracking or checking... you can get it with BARE STOODY MANGANESE electrodes. If you are willing to sacrifice high "physicals" produced by these bare rods for the sake of somewhat easier application... coated rods may do the job.

After a little experience, welders will find the NEW STOODY MANGANESE bare electrodes almost as easy to handle as many of the current coated rods. They will notice immediately how smoothly it lays down and its freedom from any tendency to crack. *Here is a manganese that is REALLY DIFFERENT—and better!*

In as-welded deposits, Bare Stoody Manganese produces these

unusually high physical properties. We believe there are none better:

Ultimate Tensile Strength—85,000 psi; Yield Point—61,000 psi; Elongation in 2"—18%; Reduction of Area—18%; Hardness (as deposited)—165-175 Brinell or 85-90 Rockwell B; Hardness (work hardened)—375-425 Brinell or 45-50 Rockwell C.

While we supply coated manganese, we earnestly suggest a thorough test of Bare Stoody electrodes... *for greater toughness... higher impact strength... full Hadfield properties... fast burn-off... low penetration... unusually good arc characteristics.*

For your next job order bare manganese from your Stoody dealer. Compare this rod with anything you've seen before. We're glad to leave the future choice in your hands. Literature is available.



STOODY COMPANY

11936 East Slauson Avenue • Whittier, California



The new Yardmaster power mower facilitates cutting under guardrails and right up to posts on highway work.

Self-Powered Mower With a Sickle Bar

The Yardmaster power mower manufactured by Ronco Products, Inc., 1209 Glenwood Ave., Minneapolis 5, Minn., is designed for use with a Leafmill, reel-type mower, or sickle-bar attachment. The unit may be self-propelled by a 4-cycle air-cooled Lauson Model RSC or a Briggs & Stratton Model N engine. It may be free-wheeled at the operator's choice by turning the right handlebar grip, which is the clutch control.

The Leafmill attachment has a 20-inch sweep and picks up leaves, twigs, nuts, etc., grinding them into small particles and dropping them back onto the grass. The reel-type mower also has a 20-inch cutting width and will cut grass 1 1/4 inches from a wall, post, or other obstruction. The sickle-bar attachment permits the unit to reach in and get out of tough spots such as fence rows, guardrails and overhanging bushes. It has a 36-inch sweep.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 99.

Reflectors for Signs And Highway Markers

A 4-page folder describing Reflexite, a retrodirective reflector of precision-molded Lucite for highway signs and markers, is available from Reflexite Corp., 39 South Ave., New Canaan, Conn. Safety and cost-conscious, the company has manufactured a product which is said to be highly reflective and easy to maintain.

The reflection value of the material is the result of a surface structure which has approximately 2,900 accurate spherical lenses per square inch. The literature points out that by altering the thickness of Reflexite plastic sheets, the cone of reflected light can be controlled to a long-range high-intensity signal value or a relatively wide-angle return beam as required for street signs and other short-range use. The product may be obtained in 9 x 8-inch sheets or in individual stock letters.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 131.

New Koppers Officers

General Brehon Somervell, President of Koppers Co., Inc., Pittsburgh, Pa., was named Chairman of the Board of Directors at the recent annual meeting of the Board. His election followed the retirement of J. P. Williams, Jr., as Company Chairman.

The Board also appointed W. F. Munnikhuysen, formerly Vice President and General Manager of the company's Wood Preserving Division, to the position of Executive Vice President, and elected Mr. Munnikhuysen and Joseph Becker, Vice President and General Manager of the company's Engineering and Construction Division, to membership on the Board of Directors.

Levee Is Built Near New Orleans

(Continued from preceding page)

center line of the levee. From the lake bottom down to minus 25.0 elevation the material was usually of poor quality and not suitable for levee construction. Consequently the dredge ladders were lowered so that the cutter heads dug from minus 25.0 as far down as minus 63.0 elevation. Fill in place consisted of about 60 per cent clay, 20 per cent sand, and 20 per cent silt.

The dredges usually worked along a line parallel to the shore, pumping into a dike section for a complete lift before moving to the next section. They made an average 250-foot swing over the width of cut, moving ahead at about 4 feet an hour. From the dredge a floating line, 1,200 to 1,400 feet long, went directly to a pile cluster out in the lake. From that point a submerged line, from 1,000 to 1,100 feet long, ran along the bottom of the lake to the shore. The floating line assured the dredge of the necessary flexibility in its operating movements, while the submerged line was must because of the strong wave action, tides, and winds that would shift a long pipeline far off position.

The submerged line was laid in about 10 feet of water, and was made by taking 14-foot lengths of shore pipe and welding them together. The velocity of discharge ranged from 12 to 20 f.p.s. When the submerged pipe reached the shore, a Y-connection permitted pumping into different sections of the levee so that the dredge did not have to shut down when additional lengths of pipe were added to the shore line. Of the total quantity of material dredged from the lake, approximately 58 per cent was retained in the fill.

Personnel

For the McWilliams Dredging Co., L. C. Gibbs, Vice President, and O. M. Gautreaux, Superintendent, were in charge of operations, while Jahncke Service, Inc., was represented by J. M. Moss, Chief Engineer, and Captain O. C. Daussin.

For the Department of the Army, Corps of Engineers, Jasper S. Fortenberry was Project Engineer and Lt. Joseph P. O'Hanlon, C.E., Chief Inspector on the project under the general supervision of R. G. Hodges, Field Assistant. The New Orleans District is

headed by Col. Charles G. Holle, District Engineer.

Consultant for Welding Firm

The National Welding Equipment Co., San Francisco, Calif., has made E. L. Mathy its Sales and Advertising Coun-

selor. Mr. Mathy is well known in industrial circles for his work with Victor Equipment Co., whose sales promotional and advertising programs he developed. He plans to confine his consulting services to a limited number of clients in order that he may serve them more effectively.

Cutting
WIRE ROPE
is easy

• **FAST** Especially designed cutting blade and dies assures fast cutting action. The hammer principle eliminates any special skill requirements.

• **CLEAN** Wire rope ends are cut smooth and clean for perfect threading or splicing.

• **SAFE** The enclosed cutting blade locked in the body of the cutter assures perfect safety.

• **PORTABLE** Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1 1/16 inch, 1 1/2 inch.

the
MORSE-STARRETT
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The "HUSKY" All-Purpose Grader

Make a big saving on your maintenance this season.

Re-shape those rutted roads and drag them the smoothest ever with a 12-foot or 14-foot "HUSKY" blade. It digs and pulls a full blade of dirt. Eliminates washboarding. Many counties now save on their big expensive equipment by using "HUSKIES" instead on this light work. Use "HUSKY" with 8-foot digging blade for ditch cleaning and heavy grading work. Pays to buy both blades for all purpose work.

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Convention Calendar

May 11-12—Highway Conference

Fourth Annual Highway Conference, University of Florida, Gainesville, Fla. L. J. Ritter, Associate Professor of Highway Engineering, University of Florida.

June 12-15—WASHO Conference

Twenty-ninth Annual Conference, Western Association of State Highway Officials, Hotel Mapes, Reno, Nevada. C. V. Melarky, Registration Chairman, Nevada State Highway Dept., Carson City, Nev.

June 26-30—ASTM Meeting

Annual Meeting and Ninth Exhibit of Testing Apparatus and Equipment, Chalfonte-Haddon Hall, Atlantic City, N.J. C. L. Warwick, Executive Secretary, 1916 Race St., Philadelphia 3, Pa.

July 12-14—ASCE Summer Convention

Summer Convention, American Society of Civil Engineers, Toronto, Canada. Don P. Reynolds, Assistant to the Secretary, 33 W. 39th St., New York 18, N.Y.

Free Diesel Training Offered to Mechanics

Free training courses on diesel-powered trucks and buses are now being given by the Mack Truck Co., Empire State Bldg., New York City. There is a mounting need and opportunity for trained diesel mechanics everywhere, due to the shift to diesel power in heavy-duty vehicles, the company says. To help fill this need, Mack is establishing its courses in over sixty cities throughout the country and has already initiated them in Boston, Albany, and New York City.

The course consists of 10 two-hour evening sessions presented by a panel of seven Mack diesel engineers and service men. Mack's aim in establishing these courses is to show that a competent gasoline-engine mechanic can, with relatively little training, become equally competent in diesel maintenance. Any person employed in the maintenance or operation of diesel-powered units is eligible for these free courses.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 75.

Triangle-Shaped Carbide Rock Drill

A line of Tri-Point rock drills for drilling granite, sandstone, hard limestone, concrete, etc., has been announced by Kennametal, Inc., Latrobe, Pa. Cutting tips are made of vacuum-sintered cemented carbide and are triangular to give maximum resistance to wear and shock, as well as freedom from packing. Drill shanks are of heat-treated alloy steel.

The Kennametal Tri-Point rock drills may be used in air or electric hammer-type drills. Diameters range from $\frac{3}{8}$ to 1 inch. Lengths are from $7\frac{1}{2}$ to 12 inches, depending on drill diameter.

Further information may be secured from the company by requesting Leaflet K-111. Or use the Request Card at page 16. Circle No. 136.

Maintenance Cleaning

A new formula for a cold liquid cleaner particularly suitable for use on electric motors and generators, and effective for general machine and automotive maintenance, has been developed by the Electrochemicals Department of E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. Tests under service conditions and industrial usage have indicated that this compound, called Cleaning Mixture No. 49, dissolves grease rapidly, evaporates quickly, and is practically inert to ordinary electrical insulating materials, the company explains.

The mixture is composed of 30 per cent by volume Blend CC No. 49 and 70 per cent Stoddard Solvent. Blend CC 49 is available from Du Pont distributors, many of whom are also prepared to supply the complete mixture. Stoddard Solvent is generally available, but is not manufactured or sold by Du Pont. Service-shop owners and industrial maintenance departments who prefer

to prepare the mixture themselves may purchase the ingredients and do so.

This literature on Cleaning Mixture No. 49 may be obtained from the company, or by using the Request Card at page 16. Circle No. 132.

Gen. Reybold to Head ARBA

Lt. Gen. Eugene Reybold, wartime Chief of Engineers, U. S. Army, has been appointed Executive Vice President of the American Road Builders' Association. He succeeds Charles M. Upham who recently retired after 24 years as ARBA executive head.

General Reybold's Army career dates back to 1908. He served as a colonel in World War I and was transferred from the Coast Artillery to the Corps of Engineers with the permanent rank of major in April, 1926. He served as District Engineer at Buffalo, N. Y.; Wilmington, N. C.; and Memphis, Tenn.; and as Southwestern Division Engineer at Little Rock, Ark. Other tours of duty took him to Virginia, Washington

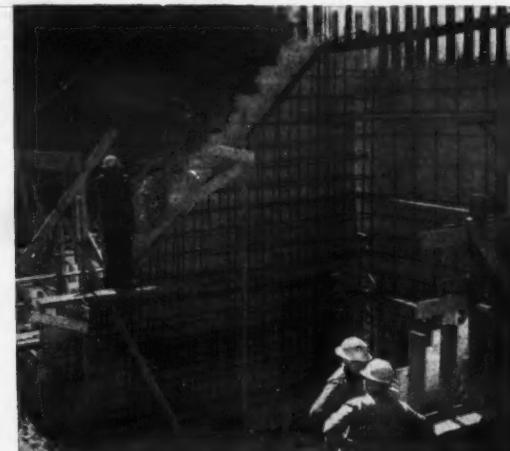


Lt. Gen. Eugene Reybold has succeeded Charles M. Upham as ARBA head.

(D. C.), and the Philippines. He was awarded an Oak Leaf cluster in World War II, and retired from the Army in 1946.



Starting the hole through south side of mountain. Workmen take cover behind trucks as rock is blasted. Rock removal continued for weeks before "holing through."

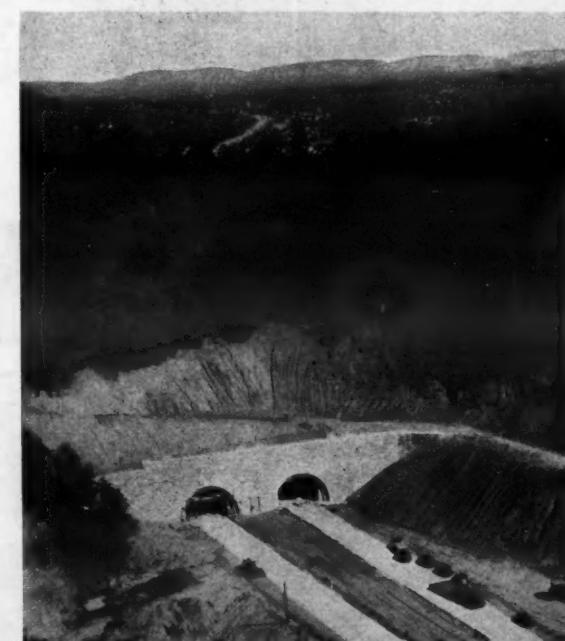


Bethlehem Reinforcing Bars in place at tunnel entrance. Entire project used approximately 340 tons of Bethlehem reinforcing steel.

Twin-Bore Parkway Tunnel in Connecticut



After tour of inspection during construction. Left to right: Harold Defelice and L. G. Defelice, contractors; W. C. Maynard, project engineer, State of Connecticut; and Wesley Brandt, chief of survey party.



Bird's eye view of the tunnel as construction work nears completion at south portals. Note continuation of highway on far side of mountain.

To provide a faster, more direct route for motorists using the Wilbur Cross Parkway in the New Haven vicinity, the Connecticut Highway Department recently authorized construction of a twin-bore tunnel through West Rock, a mountain west of New Haven. The new tunnel is 1200-ft long, and each tube accommodates two lanes of traffic. It is equipped with automatic ventilating equipment and traffic control signals, and an elaborate lighting system which approximates at all hours the day or night conditions outside the tunnel. Contractors: L. G. Defelice & Son, Inc., New Haven, Conn., and Gull Contracting Co., Flushing, N. Y. Reinforcing steel was furnished by Bethlehem.

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Twin portals at north end of tunnel. The shaft house, which provides outlet for ventilating system, is shown above and between portals, among trees.

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Oil Highway Crosses Famed Mountain Pass

An Inverted-Penetration Treatment Makes Available Good Highway Through Pass Used by Pioneers

FOR the low price of \$225,000, Northwestern Engineering Co. of Denver and Rapid City recently finished 44 miles of inverted-penetration asphalt pavement for the Wyoming Highway Department. The project makes available for the first time a modern hard-surfaced highway across South Pass, where Marcus Whitman first crossed 125 years ago.

The same winds which dogged pioneer wagon trains still whip across the Continental Divide near the center of the project. Rarified air at 8,000 feet, which in the old days caused oxen teams to breathe hard, slowed progress by stealing power from 1949 internal-combustion engines. Buffalo grass and brush, stripped from the gravel pits that were there when Whitman built his campfires, is the same as always. So is the rock: some of it so fine that Northwestern's crusher had to reject much of the sand to produce acceptable aggregate.

One other thing is not changed. The scenery is still majestic, and this part of Wyoming still is full of big game. Crews saw antelope, sage hens, deer, and occasionally moose, elk, and bear.

Completion of the project makes available a new short cut over the mountain backbone between Lander and Farson. Connecting highways at those two towns provide a new way of getting to and from the Big Horn Basin. Residents of towns like Worland and Thermopolis, who formerly had to go to Denver to reach a big city, can now take the new short cut and be in Salt Lake City in less time.

The general route of the highway was used first by Indians. Then Marcus Whitman brought a wagon train across the hump, near the place where Atlantic City and South Pass now stand. The trail grew into a stagecoach road. As the years went by, a rough, winding gravel surface was added. Two years ago the Wyoming Highway Department called for grading bids. Ground water, springs, snowstorms, high altitude, and rocky terrain stood ready to impede man's march as much as possible. The battle which Knisley-Moore of Douglas, Wyo., fought in getting the new alignment across the mountains was featured in a previous article in this magazine. (See C. & E.M., Feb., 1948, pg. 11.)

Those accomplishments are now a part of the history of the development of the pass. So is the low-cost asphalt work which Northwestern Engineering Co. finished in less than 3 months. Between May 23 and August 10 last season, this fast-moving outfit made 31,500 cubic yards of 2-inch select material surfacing, 65,500 tons of 1-inch crushed-gravel surfacing, 11,500 tons of $\frac{5}{8}$ -inch cover material; installed 16,200 feet of snow fence; and cleaned up after finishing the laying of the aggregates and asphalt.

A Two-Lane Highway

The completed highway carries with ease two lanes of 1950-model vehicles. The asphalt surface, 22 feet wide, was centered on an asphalt seal 30 feet wide. This provides 4-foot shoulders on each side. While construction costs on grading figured high in the design, the earth work is remarkably complete for a project of this near-secondary type. The cuts are wide, the slopes are as flat as possible, considering the cost of doing work at this location.

In all cases the cuts were daylighted

to minimize snow trouble as much as possible. There is plenty of drainage to carry the water away through fills. Every slope in a cut section is back far enough so there will be no danger of slides.

South Pass, however, gets some vicious snowstorms. So one of the contract items called for over 3 miles of timber snow fence, placed at strategic locations to intercept drifts before they can plug up the new highway. There were several bad snowstorms after work started on May 23. An official of Knisley-Moore was caught in a snowstorm during the grading, and was marooned on his project for three days.

Rock Crushing

Previous location work by Highway

Department engineers had resulted in the designation of 3 crushing-pit sites. The first of these pits was about 1½ miles from the north end, on the east side of the highway. The second was on the same side, and 15 miles farther south. Approximately 13 miles lay between this pit and the southernmost, which was 14½ miles from the south end. The 14½-mile haul from this pit was the longest on the project.

Rock in these pits consisted of a mixture of stone thrown up by seismic action a long time ago. Much of the pit-run material is rounded, showing travel. The crusher had hardly begun work in the northernmost pit before General Superintendent Don Baker and Resident Engineer George Snyder knew they had a problem on their hands. The pit-run material contained an excess of fines smaller than No. 4. The only solution was to waste them through the crushing plant, separating the good material.

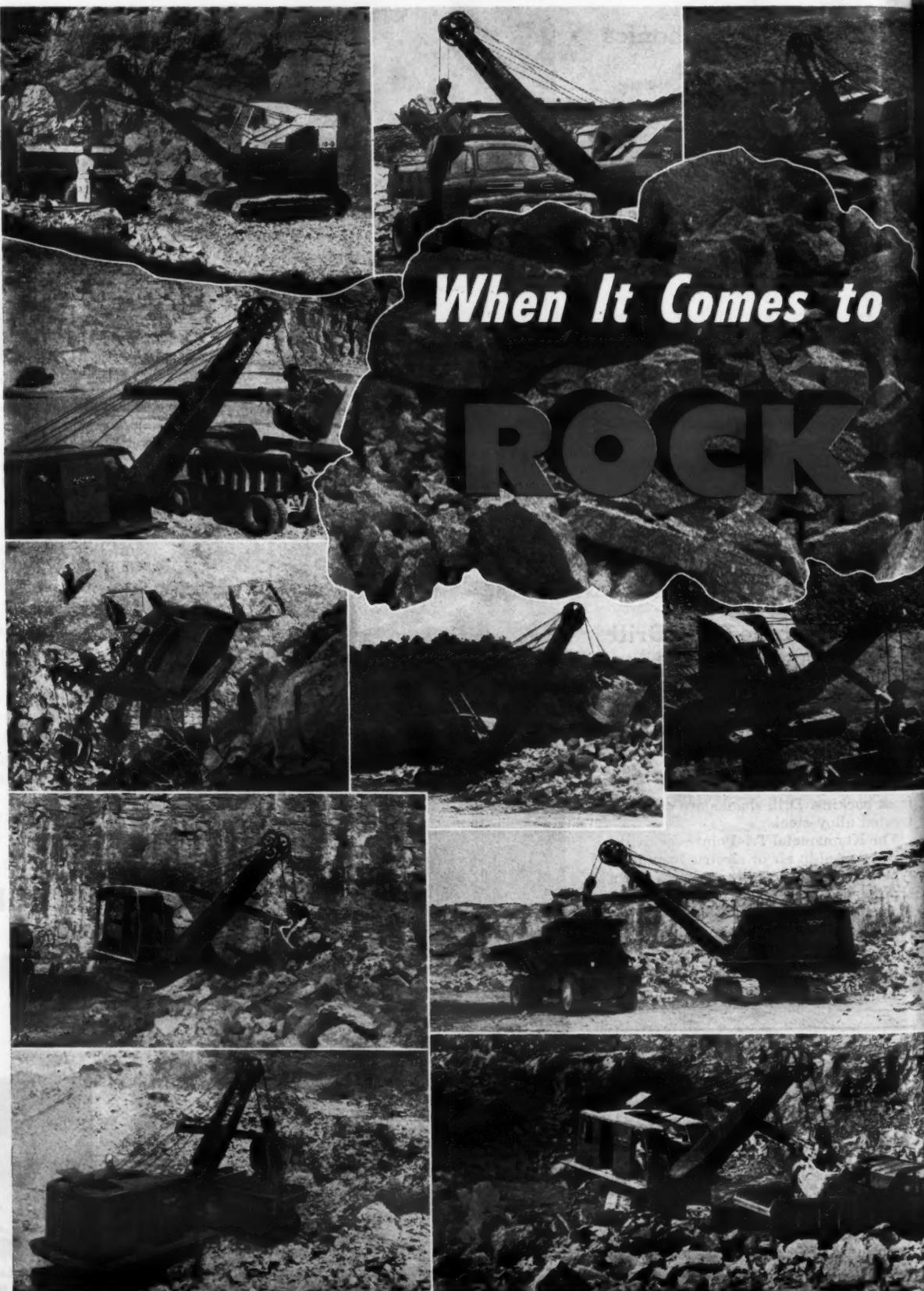
This streak of bad luck took approximately 70 per cent of the effective

crusher run in that pit, and slowed down the project by perhaps a week. But the second set-up in the next pit was in much better rock, where practically all of the material could be used. The southernmost pit was the rockiest of all, and the crusher gnawed away at the excellent production rate of 4,000 tons in its daily 16-hour run.

Northwestern Engineering Co. used the new Pioneer 46 VE Duplex crushing plant, a self-contained rock-production unit blending diesel with electric power. Its main power plant is a Murphy diesel engine, which also drives an electric generator to furnish juice for the various electric motors which drive the conveyors. The Murphy engine was mounted on a portable truck, and was capable of being moved in a hurry. It drove the Pioneer plant by means of a flat-belt hook-up.

A Caterpillar D8 tractor with a Woolridge 8-yard Rolling Bowl scraper brought the pit-run material up to within about 50 feet of the plant trap.

(Continued on next page)





C. & E. M. Photos
One of Knisley-Moore's D8 Caterpillars with a Wooldridge scraper brings a load of pit-run material to the Pioneer 46 VE Duplex crushing plant shown in the photo at right.

where an International TD-18 with a Bucyrus-Erie blade fed the machine. The dozer also helped out occasionally by pushing the scraper when the trap was full.

The 30-inch Pioneer feeder in the trap was adjustable. Its intake was proportioned properly to maintain an optimum output from the crusher. The raw material from the feeder passed to the

plant over 50 feet of 30-inch conveyor, where it was dumped to the bottom deck of the screens. Throughs fell immediately to a mixing bin, and out over a delivery belt to the 21-cubic-yard surge hopper where trucks were loaded.

Oversize rock retained on the bottom screen passed through a 10 x 36 jaw crusher and back over the deck for reclassification. All material which dropped through the top deck was



return line, which carried them to the top screen deck. Oversize from the top deck passed through a 22 x 40 roll crusher and back over the deck for reclassification. All material which dropped through the top deck was

routed by chutes to the delivery belt leading to the surge bin. None of this material passed through the lower screen deck.

A road leading under the 21-cubic-yard surge bin permitted trucks to drive under without backing and pick up their loads. From 15 to 35 machines carrying from 8½ to 20 tons of material were used, most of them rented. They included Chevrolets, Reos, GMC's, Mack's, Whites, and Internationals.

It was an interesting fact that in a single day, when work was in high gear, the 500 to 600 heavy loads of crushed rock were equal to about 6 months of ordinary traffic over this highway. Despite the frequency of heavy loads, only a few soft spots developed in the previously built sub-grade. When soft spots were discovered, a motor grader dug them out and they were backfilled with good gravel. They gave no more trouble.

The extreme punishment caused by the high altitude stole engine power and caused poor performance in spite of any adjustments that were made. A truck in excellent condition at an altitude of 4,000 feet would sputter, spit, and refuse to run efficiently in this location. While the grades on the new highway are all under 6 per cent, the dump trucks had to go to super-low gear to haul their loads of gravel. It was slow, brutal business, and the only solution for the loss of power was to hire more units to make up for the difference.

The 4-cylinder engines on the project lost more power and performance than the 6-cylinder makes. This was especially noticeable on motor graders, according to Don Baker, General Superintendent.

Crusher maintenance consisted principally of screen replacement, and regular daily hard-facing of the rolls. As a general rule the rock was not as abrasive as most pits on the Continental Divide, and high hourly output was the rule.

Preparing for Oil

The subgrade completed previously under the other contract had been exposed to a bad winter, with considerable traffic. It was therefore necessary for Northwestern's crews and equipment to reshape the road to the lines left previously.

Two Caterpillar No. 12 motor graders and two Adams No. 512's were used. Working long stretches at a time, they quickly smoothed the earth and re-established the 6-inch crown. A survey party under Resident Engineer George Snyder kept pace, giving grades for the operators.

After the road was reshaped, there were numerous places where additional select material was needed. This condition had been foreseen and written into the specifications, which provided for this purpose 31,500 tons of 2-inch material. This select rock was dumped in the places where it was required, in a lift from 4 to 5 inches thick. Two International rubber-tired MD tractors

(Continued on next page)

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Oil Highway Crosses Famed Mountain Pass

(Continued from preceding page)

with Bros pneumatic rollers covered the material about eight times to get compaction. While the spreading and rolling were in progress, several 3,000-gallon water tank trucks sprinkled the material. Water was available practically anywhere on the route. The surface was ready for the inverted-penetration oil treatment when the 2-inch rock had been placed and rolled.

Oil Treatment Moves Fast

Sections as long as possible, often up to 5 miles, were selected for the oil-penetration treatment. "We like to line out and go fast when we start the oil," Baker explained.

The work followed a very orderly procedure, arranged as follows:

Step 1: From 1 to 3 inches of crushed gravel was hauled to the highway, and dumped along the west quarter point. This material was then road-mixed wet by the motor graders, and laid out in its permanent shape. The Bros pneumatic rollers were used to put as much compaction as possible in the material.

Step 2: The first penetration shot of asphalt was applied. For the first 19 miles, 0.4 gallon of MC-1 was used per square yard. Because of adverse characteristics of altitude, snow, and bad weather, the first penetration shot was then changed to MC-O for the balance of the job. This first application was made by a 2,000-gallon Rosco and a 1,100-gallon Littleford distributor, making two 15-foot-wide passes to cover the 30-foot roadway width.

The asphalt for this penetration shot was trucked in from the Casper, Wyo., refinery of Socony-Vacuum Co. Three 4,000-gallon and three 2,600-gallon tank trailers were used. They were owned by Northwestern Engineering Co., and they delivered the asphalt at its application temperature of from 200-275 degrees.

The first penetration oil was allowed to set with no further work for 24 hours or longer. Tests made by cutting



C. & E. M. Photos

into the pavement showed that the MC-O had penetrated about 1 1/2 inches.

Step 3: Using a 22-foot spraybar, the

Rosco distributor then moved over the construction section and shot 0.4 gallon of MC-4 per square yard. This oil was sprayed at 250 degrees directly on the

MC-O previously applied.

Step 4: Moving along behind the distributor, a 12-foot Highway and a 10-foot Buckeye spreader box on the back

end of top-course trucks now spread

40 pounds per square yard of 5/8-inch cover rock. This cover course was immediately covered about eight times with the heavily ballasted Bros pneu-

(Concluded on next page)

16th TRAXCAVATOR ADVANTAGES RANGE FROM COST TO PRODUCTION



This T6 TRAXCAVATOR concentrates its traction-harnessed 65 horsepower of "crowd" on the bucket and crumbles thick concrete sidewalk like a cookie! Note, too, that the 5-gated T6 pivot-turns, and carries its load at the speed that suits the situation.

There's nothing else like T6 and T7 TRAXCAVATORS in the heavy-duty equipment field for multi-purpose usefulness and big production. Nothing less than a fleet of assorted, limited-use machines can match a big TRAXCAVATOR at digging, stripping and loading broken pavement and soils as tough as they come!

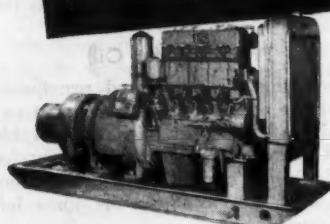
That tells you why big TRAXCAVATORS get the call to strip and load thousands of tons of brick, blacktop and concrete pavement.

It shows, too, why these big units perform the functions of various specialized equipment on other road and street jobs. They prepare sub-grade; widen shoulders; charge crushers and mixers; help produce surfacing materials, dig, grade, carry and load. All at record low cost!

Besides their production advantages, TRAXCAVATORS are unit-engineered with their matching "Caterpillar" Diesel Tractors, for long life and low upkeep. Built in 5 models (1/2 to 4 cubic yards capacity), the TRAXCAVATOR line offers you the greatest range of sizes — providing a size for every job and purpose. See your TRACKSON—"Caterpillar" Dealer for full information. Or write TRACKSON COMPANY Dept. CE-50, Milwaukee 1, Wisconsin.

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Kilowatts



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Tractor Excavator

matic rollers. The hot MC-4 penetrated upward, holding the $\frac{1}{8}$ -inch material in a tight bond.

Step 5: A drag broom was then used to sweep the surface lightly. Northwestern maintained the construction section for 48 hours, and then turned it over to state maintenance men, who used a power broom to sweep the section once or twice during the next ten days.

With the completion of sweeping, the section was done. It was smooth, durable, and tough for its low unit cost. There will be an excellent highway for years to come, if maintenance is done promptly in the spring after the snow break-up. Heavy loads chattering up the long grades on a hot summer day will cause the top asphalt to bleed a bit, but this can always be corrected by a seal and chips, or perhaps by brooming if the bleeding is not severe.

Crushed-aggregate sizing was strictly observed, and the two principal aggregates used in the oil mix were manufactured as follows:

Base Course, 1-Inch	
Screen Size	Per Cent Passing
1-inch	100
$\frac{3}{4}$	75-100
No. 4	40-75
No. 10	30-60
No. 200	3-15

The fraction of this material passing the No. 200 sieve was controlled to a point not greater than half the fraction passing the No. 40 sieve. The fraction passing the No. 40 mesh was held to a liquid limit not greater than 30, and a plasticity index not greater than 7, with the exception that where the PI was zero, the liquid limit could still be no more than 30.

Top-Course Material, $\frac{1}{8}$ -Inch	
Screen Size	Per Cent Passing
$\frac{3}{8}$ -inch	100
$\frac{1}{2}$ -inch	90-100
No. 4	50-70
No. 10	30-60
No. 200	3-10

Specifications stipulated a liquid limit not greater than 30 for this material also.

Snow Fence Built

Maintenance men stationed at Lander already appreciate the 16,200 feet of snow fence erected under the contract. This is standard Wyoming Highway Department fence, designed to stay in place throughout the year.

It consisted of 16-foot portable sections, made by nailing 1 x 6 rough native lumber to three triangular tripods made of 2 x 6 rough lumber. The sections were set in place with the board side facing the direction of snow. The toe of each tripod was staked down by driving pieces of $\frac{1}{8}$ -inch reinforcing steel in the ground in an X pattern, securing the intersection with wire.

The fence is stout enough to resist the weight of a heavy snowdrift, or to hold its own if a bull moose should want to scratch his massive head on one of the boards.

Despite rain and snow at the start of the job, coupled with too many fines in the first pit and the lowered efficiency of engines at high altitudes, the project was done with a minimum of trouble in less than 3 months. Superintendent Baker was lavish in his praise of Resident Engineer George Snyder, who "is the fairest, most competent Resident anywhere in the Rocky Mountain region". Snyder had the same reputation when the western editor of this magazine visited the site in 1947.

Personnel

The project was designed and administered under the supervision of J. R. Bromley, Superintendent of the Wyoming Highway Department. Morris Adelstein is President of Northwestern Engineering Co., and other contractor men included John A. Moses, Oil Foreman; Bill Meyer and Bill Sims, Crusher Foremen; and Doyle Weigner, Field Clerk and Timekeeper.

Removes Tramp Metal From Conveyor Belts

Self-contained permanent magnetic pulleys and unit-type separators have been developed by The Homer Mfg. Co., Lima, Ohio, for use wherever there is need for ferrous-metal extraction in the handling of belt-conveyed materials.

In the Homer unit-type separator, ferrous metal is extracted by the use of a permanent magnetic pulley; a short, endless, nonmagnetic belt; and an idler pulley. The magnetic pulley holds the ferrous metal or materials against the belt until it has passed around the pulley and beyond the magnetic field, where it is automatically discharged. The separator is powered by an electric motor and a direct-coupled gearbox. Other methods of driving can also be employed.

The separator is available for either stationary or portable uses. It can be used in tandem operations in large belt-conveyor systems, to permit the

turning of a flow of material from one conveyor to another and the automatic removal and discharge of ferrous material during the operation.

Homer permanent magnetic pulleys and pulley units are self-contained and require no outside power source for

operation; this eliminates the chance of accidents due to power failure. The pulleys are energized and operate at all times, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 96.

Want to Save Money on Asphalt Mixing?

The Foote Kinetic Asphalt Mixer will give you 8 to 10 more batches from a barrel of asphalt. One user* has reported savings of \$5.22 a ton. They used to buy their material for \$10.50 a ton. Now they make it with the Foote Kinetic Asphalt Mixer for \$5.28 a ton. \$5.22 a ton is worth saving! Such savings will soon pay for your Foote Kinetic Mixer.

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Mobile Wagon Drill Mounts on a Tractor

A new one-man-operated self-contained and self-propelled wagon-drill unit, which uses the Tractair 105 tractor-compressor, has been developed by Le Roi Co., 1700 S. 68th St., Milwaukee 14, Wis. Designed for fast drilling operations on quarry, gravel-pit, and road-cut jobs, the Mobildrill consists of a swinging boom which extends out from the Tractair platform and a universally mounted wagon-drill guide shell for a 6-foot steel change. The Le Roi - Cleveland H10 45-pound-class sinker operates off the 105-cubic-foot compressor. With truck-mounted Mobildrills where 160-cfm compressor capacity is available, an 80-pound-class sinker may be used.

Flexible enough to drill angle, vertical, or horizontal holes at any elevation, the unit can be equipped with an air-motor-powered boom, according to the company. One man can handle all phases of drilling. Drill, blow, and feed controls are centrally located at the guide shell. The steady, cushioning Le Roi-Cleveland type of piston feed is effective in faulting ground and with the new carbide insert bits, Le Roi says.

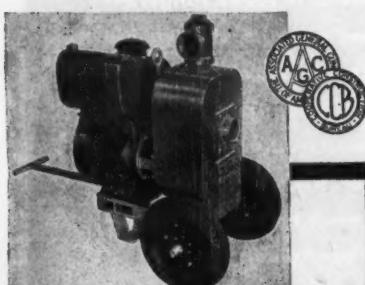
The 35-hp tractor is designed to operate over rough terrain and eliminates the need for trucks or extra help to move wagon drill and compressor. It has 4 forward speeds up to 12 mph and a reverse gear.

Further information may be secured from the company by requesting Bulletin T16. Or use the Request Card at page 16. Circle No. 72.

Flash Butt Welding

Features of flash butt welding by controlled techniques, along with typical product applications, are shown in an illustrated 20-page booklet prepared by The American Welding & Mfg. Co., Warren, Ohio. Products and subassemblies ranging from 4 to 100 inches in diameter, and in almost any length, are described. Featured are copper, aluminum, carbon steel, wrought heat-resisting alloys, forgings, and cast iron as metals which have been successfully flash-butt-welded into a variety of products.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 12.

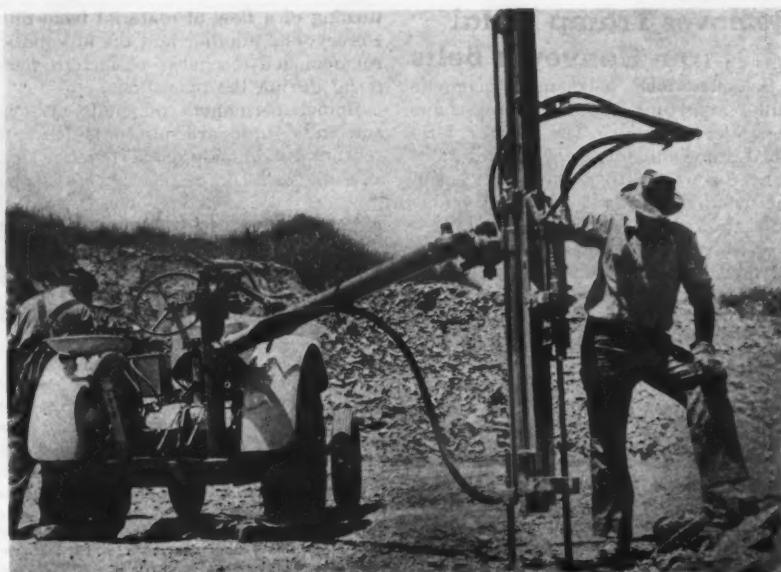


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Here's the pump with high capacity at low operating speed for longer engine life. All-welded construction for lighter, stronger, more durable unit. Automatic priming—no moving parts or jets. Improved non-clogging impeller of special iron alloy. Hardened wear plate, for longer life. Fewer moving parts—hence less wear and lower maintenance cost. Large access plates—making inspection and repair easier. Fully tested and trouble-free after assembly.

All McGowan Pumps comply with contractors pump standards as adopted by the AGC. New Units—Rental Units—Repair Parts carried in stock by nation-wide dealers.

LEYMAN MANUFACTURING CORP.,
CINCINNATI 2, O.



Self-contained and self-propelled, the Tractair Mobildrill is designed for fast drilling in quarries, gravel pits, or road cuts.

Mobile Machine Shop

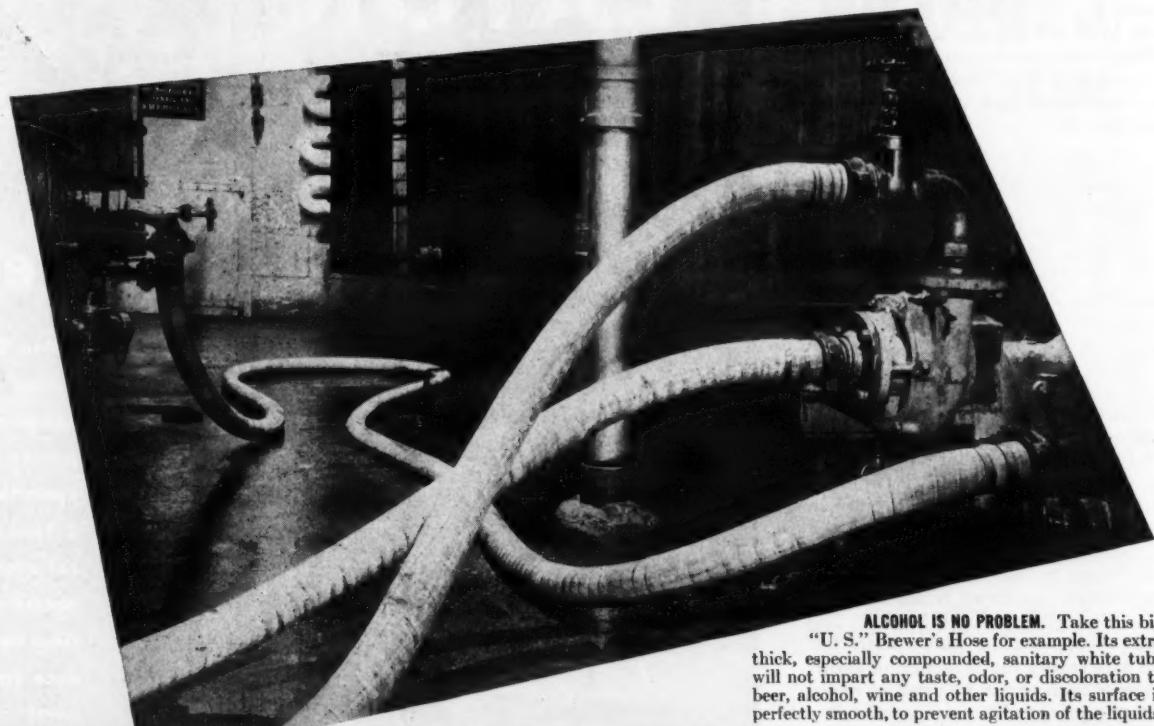
Literature describing a completely mobile machine shop has recently been made available by the Davey Compressor Co., N. Water St., Kent, Ohio. The Davey unit is a truck-mounted repair shop for use by contractors, highway departments, and utility organizations which have to operate over an extensive area.

The standard truck is assembled around three basic power units: a Davey air compressor, an electric-power generator, and a welding generator. The catalog points out that it is possible to include almost an unlimited number of pieces of equipment and accessory combinations in the mobile machine shop. Some 24 principal items with which the unit might be equipped are suggested; photographs and floor plans illustrate typical arrangement and inventory of them.

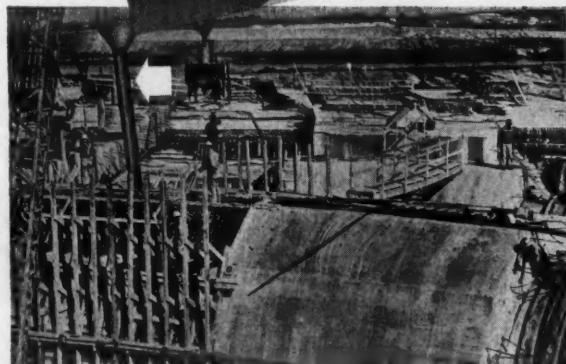
This literature may be obtained from the company, or use the Request Card at page 16. Circle No. 125.

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ON THIS BIG DAM in the Middle West contractors used U. S. Elephant Trunk Hose for dropping concrete speedily and efficiently into tight forms and inaccessible places. Since the hose is flexible, it can be maneuvered and led into spots where concrete could not be dropped directly.



RESISTANCE TO PETROLEUM OILS is built into U. S. Oil Hose for suction or discharge work at refineries, terminals, and loading or unloading tankers or barges. The special U. S. constructions combine adequate pressure resistance and durability while allowing required flexibility.

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Macomber steel roof deck plates are welded at the top and bottom on the left side, in order to maintain correct alignment. Various lengths are available.

Steel Roof Decking

Two types of ribbed-steel roof decking for lightweight industrial buildings are fabricated by Macomber, Inc., Canton, Ohio. Available in various lengths, 18 inches wide, these sections are made in a standard and a wide rib. Bearing ribs are 6 inches on centers, 1½ inches deep, and have ample throat for topside down-hand welding.

Required filler, side, cover, and closure plates are furnished to fit the particular dimensions of a roof area. Installations which require other types of finishing plates such as cant, eave, end, sidewall, and expansion joints are furnished when specifically requested. Metal screws are used in all field connections and are furnished with the decking.

Macomber decking, available in Nos. 18 and 20 U. S. standard-gage steel, is laid in sections from left to right. The starting plate, the company points out, should be accurately aligned as a guide for succeeding plates and welded at top and bottom on the left side to maintain correct alignment before other plates are added. These anchoring welds are on 18-inch centers, saving time and labor costs, according to the company.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 4.

Year-Round Truck Spreader

A 4-page folder describing the Century hydraulic spreader for ice control and seal-coating work has recently been issued by the Century Engineering Co., Waukesha, Wis. Designed as a two-in-one machine, this spreader features quick attachment, one-man operation, controlled direction and width of spread, and controlled amount of feed. The literature explains each feature and gives complete specifications. On-the-job photographs illustrate the spreader in operation.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 37.



Overall Dimensions 12½ in. x 7½ in. x 7 in. Handle 10 in. long. Drum size 3 in. dia. x 6 in. long x 6 in. dia. flanges. Weight 100 lb. 3/4 in. Wire Rope. Illustrated with 50 ft. 1/4 in. Wire Rope. Shipping Wt. 37 1/2 lbs. GUARANTEE — Five-day return privilege.

\$39.50 WITH 50 FT. OF 1/4 IN. WIRE ROPE
Send remittance with order and we prepay postage

GOLD FOUNDRY & MACHINE WORKS
1618 S. Osage St., Dept. CE, Independence, Mo.

Road Conditioner

The new Beadle oil road smoother announced by Coates Mfg. Co., Corydon, Iowa, is designed to do the work of disk, maintainer, pulverizer, and roller. It reclaims and saves existing material by reconditioning old asphalt, oil, or tar surfaces. The unit trowels and pulverizes the old bituminous surface, creates heat that livens up the bitumen, then spreads, smooths, and compacts the restored material into a new wearing surface, the company says.

The Beadle oil road smoother is an attachment for all standard makes of motor graders, replacing the regular moldboard on the machine. It is handled with the standard controls already on the machine. It can be taken off and the regular moldboard placed in use again at any time. The change-over may be made by the road crew after the necessary brackets have been attached to the grader circle.

The Beadle smoother takes down high shoulders, smooths corrugations, fills depressions, and compresses the ma-



The new Beadle oil road smoother—an attachment for standard-make motor graders—reconditions old asphalt, oil, or tar surfaces. Coates Mfg. Co. makes it.

terial. Desired position of the cutting edge is controlled by a hand wheel on the vertical center screw. The unit has a 15-inch x 12-foot moldboard with a 3/8 x 6-inch cutting edge. The smoother shoes are made of high-carbon steel plate, using five 2-foot sections, and are attached to the machine by a bolt for each shoe.

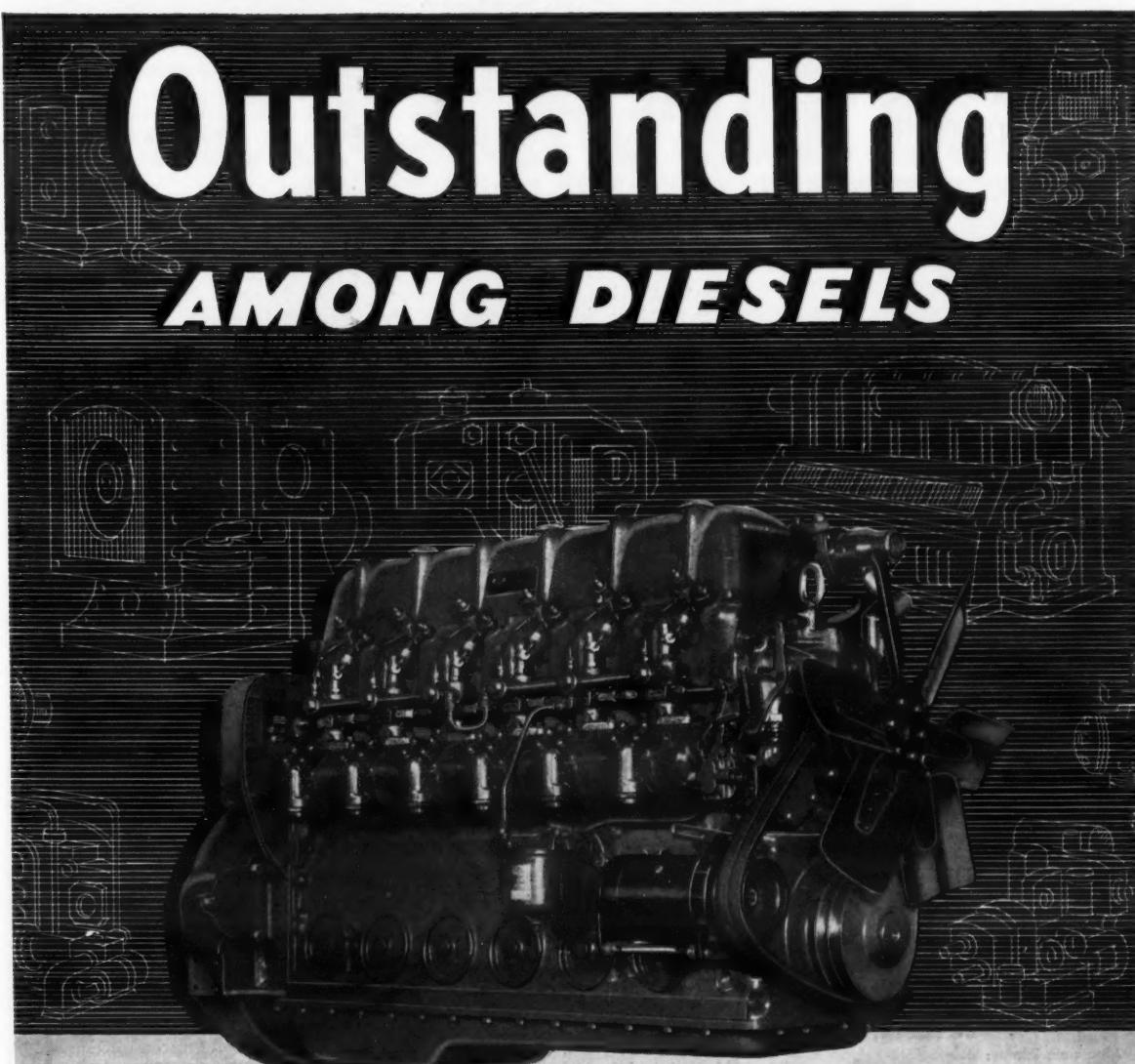
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 3.

Data on Steel Spoke Wheels

An 8-page catalog describing the Challenger steel spoke wheels with disk hub construction has recently been issued by the Geneva Metal Wheel Co., of Geneva, Ohio. The catalog describes the construction of rims, spokes, hubs, and hub disks, pointing out that cast, extruded, and tubular hubs are the three standard types offered. Cross-section diagrams indicate how the hub is fabricated.

This literature, Circular 949, also explains that a wide range of semipneumatic and pneumatic tires are available for these wheels. Complete specifications are given for all types and models of wheels manufactured by the company. Diameters are 10 to 24 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 116.



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(TWO CYCLE)

More power per pound of weight — all major castings are of lightweight alloys.

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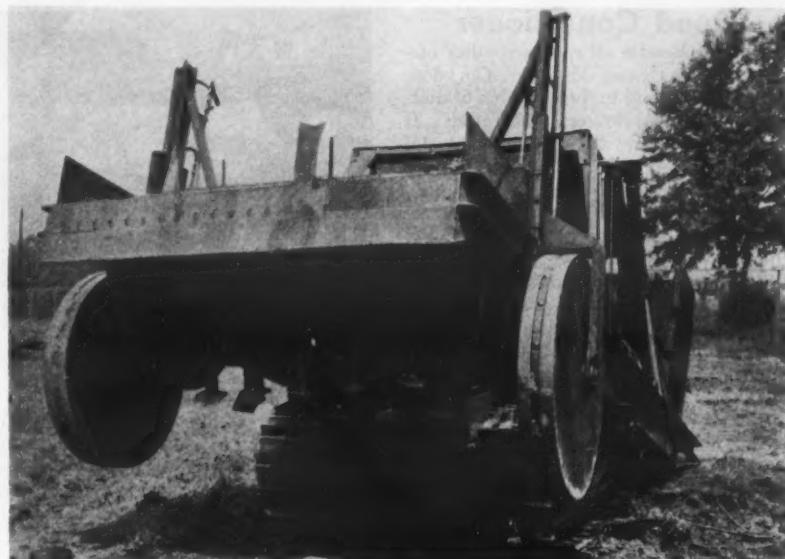
Rugged — built for the toughest job known — excavator service. Ready for any service. It pays to standardize on P&H Diesels. For complete information, write Diesel Division, Harnischfeger Corporation, Port Washington, Wis.

P&H DIESEL DIVISION
HARNISCHFEGER
CORPORATION
PORT WASHINGTON, WISCONSIN, U. S. A.

Land-Clearing Unit Rips Through Brush

A heavy-duty machine specifically designed for clearing land by shredding brush, vines, undergrowth, and trees is manufactured by the American Steel Dredge Co., Inc., Fort Wayne 1, Ind. The operating principle of the Bushwacker is this: Twenty flails made of chrome-manganese steel castings are attached to a revolving drum by 1 1/8-inch round links, and are staggered to present a continuous cutting edge 72 inches wide. Under the impact of the rapidly moving flails, the woody fibers of growth are ruptured, the stalks or trunks broken, and the whole reduced to mulch material and deposited upon the cleared ground.

Drum and flails are mounted at the front end of a rectangular steel frame carried by a modified crawler tractor. The working unit assembly is mounted at the front end of the base and the revolving drum of steel tubing is powered through a multiple V-belt and



Meet the Bushwacker, a heavy-duty land-clearing unit. This view of the front end assembly shows the flails which disintegrate stalks and trunks and reduce them to mulch.

jack-shaft drive from a diesel engine mounted at the rear of the base. The power unit is controlled by a hydraulically operated clutch set in the tractor cab. To provide further shredding action, the rotating unit is partially enclosed within a housing of abrasion-resistant steel.

The flail heads are 6 1/2 inches wide, weigh 19 1/2 pounds each, and travel around the drum at a speed of 11,500 fpm. As the machine moves into growth, the contact bar engages the brush or trees, bending them forward so that the flail heads strike as the tree fibers are under tension; this facilitates the disintegrating action. The movement of

the flails carries the broken material up against the steel drum housing, subjecting the pieces to further beating and shredding action before they fall to the ground. The limiting factor in performance is the diameter of trees in the area to be cleared. Practical ranges are from 5 to 6 inches for hard woods and 8 inches for softer woods, the company says.

The Bushwacker is designed to offer a practical mechanical means for clearing land without disturbing topsoil. The shredded residue left upon the ground serves as a mulch and retards erosion. The company states that under good operating conditions, reasonably

leveled ground, and growth 6 to 10 feet high, the Bushwacker will clear 4 to 6 acres a day.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 76.

Diesel-Engine Catalog

A 26-page catalog on diesel engines has recently been put out by the Murphy Diesel Co., 5317 W. Burnham St., Milwaukee 14, Wis. The first portion of this catalog is set up in quiz form, with ten questions and answers on the design of diesel engines—on what enables them to give more power, greater fuel economy and dependability, and longer engine life. Answers include detailed descriptions of the features of Murphy diesels. The rest of the folder explains applications and lists available models and sizes of diesel engines and generator sets.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 18.

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treated asphalt maintains its effectiveness... eliminates the need for "sweetening-up" with more additive.

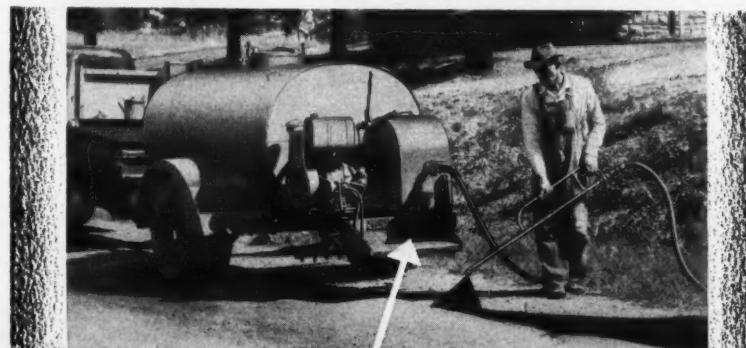
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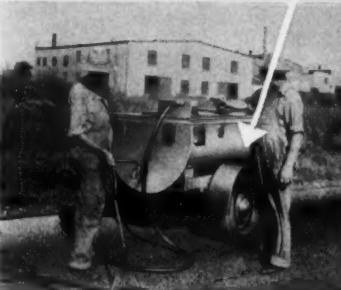
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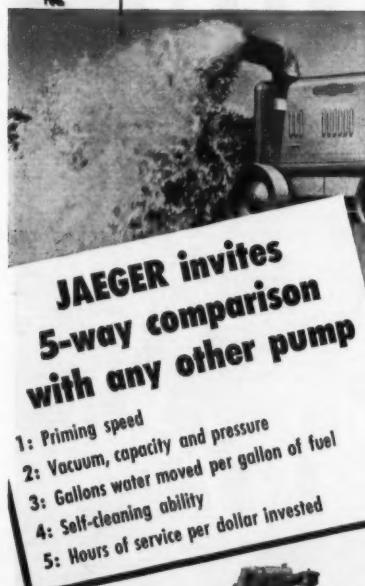
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Better Engineering Needed in Counties

When This County Surveyor Sends Questionnaire to Some Other County Engineers, the Answers Surprise Him

MANY county engineers know how deplorable the general county road situation is, hope for some improvement in county engineering standards, and are ready to begin working toward that goal.

That is the conclusion of Wayne Linthacum, County Surveyor of Big Horn County, Mont. In an effort to improve the professional standards of Montana county engineers and surveyors, Linthacum recently sent out a questionnaire in 25 sections, designed to poll the thinking of his colleagues in Montana's 56 counties. The results, Linthacum believes, are encouraging.

For example, 82.3 per cent of the officials who responded to the questionnaire voted overwhelmingly in favor of raising the qualifications for the office of County Surveyor. Their vote reflects a belief that applicants for that post should not only have sufficient background in engineering and administrative work, but should also be registered engineers before being eligible to file for office.

Returns from the questionnaire also showed that the engineers believed a salary upgrade was indicated. A salary of \$4,200 per annum was reflected in their thinking, although one surveyor was willing to work for \$2,500 per year. Top figure named was \$6,000.

Questionnaire Covers Field

Linthacum's questionnaire covered points in county engineering, administration, operation, human relations, and so on. In addition to the two points already covered, the following questions were asked:

"Are you in favor of changing the name 'County Surveyor' to 'County Engineer'?" Ninety-four per cent said "Yes".

"If the County Surveyor is qualified and capable, are you in favor of his having complete charge of road and bridge construction and maintenance?" Eighty-five per cent answered in the affirmative.

"Would you favor having all County Surveyors be elected under the same terms and conditions as those in counties having 15,000 voters?" Seventy-nine per cent favored this kind of election.

Salaries entered the questionnaire when Linthacum asked, "Would you favor having all County Surveyors on a fixed salary, rather than a per diem basis?" Eighty per cent wanted a fixed salary, 15 per cent was satisfied with the per diem arrangement, and 5 per cent showed up as rugged individualists by asking a retainer and per diem.

"Are you in favor of the County Surveyor being in charge of all county business where the services of an engineer are required or justified?" A fraction more than 84 per cent favored such an administrative set-up.

"How many years have you served as County Surveyor?" Answers to this varied from 2 to 28. Linthacum was one of the 2-year men, while C. R. Noyes of Blaine County headed the seniority list with 28 years of service.

"Do you have other work besides that of County Surveyor?" About 90 per cent did have such work, one engineer reporting that he was also the Sheriff.

"Are you designated as Road Superintendent?" Only 35 per cent had this title, while, strangely enough, only 55 per cent of the counties reported that

they had a road superintendent at all.

Organization and Planning

Linthacum's \$64 question was, "Does your county operate under the road district system, or is it under centralized control?" Answers showed that 45 per cent still used the old district system, but that the majority had now turned to centralized control as a solution to the county road problem.

Sixty-one per cent of the men said they made their road and bridge inspections jointly with the Board of Commissioners. Almost 84 per cent performed other work for their counties in addition to the engineering of roads and bridges.

When Linthacum asked, "Does the (Concluded on next page)

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(DIV. OF BLACK & DECKER MFG. CO.)

B.F. Goodrich



BFG users report: Continued savings — thanks to double bruise protection

B. F. GOODRICH *Universals* were reported by one operator to be in good condition after daily quarry service for over 21 months. Another operator reports over 4500 service hours from Universals against only 1600 hours from another make in identical service. Still another report told of tires that were still "young" at 3200 hours and probably good for thousands more. These actual user reports spotlight the great difference between various makes of off-the-road tires.

When results are measured, BFG tires always stand high. There are many reasons for the continuing top performance of B. F. Goodrich tires. For example, notice the tread on the

Universals in the picture above. It's designed to give traction both ways. More than that, it is made of specially compounded rubber . . . armor against sharp rocks and other tire killers.

Also, BFG tires have double protection in the form of a *double nylon shock shield* . . . layers of nylon cord built between the tread and the body plies. Under impact, the strong, elastic nylon shields the cord body. And there are two shields for double protection!

Only B. F. Goodrich gives you the added protection of the nylon shock shield; the added savings from (1) longer tire life (2) increased bruise resistance (3) less danger of tread separation (4) more recappable tires. Nylon shock shield costs no extra—you pay no premium.

There's a specially designed *BFG off-the-road tire for every need. See your B. F. Goodrich dealer or call *The B. F. Goodrich Company, Akron, Ohio.*



*Typical example: New ALL-NYLON tire for tough construction projects, quarry work, strip mining, etc. In all tests not a single tire blew out, not one flex break occurred!

Better Engineering Needed in Counties

(Continued from preceding page)

Board of County Commissioners respect your engineering ability?", 11 per cent were realistic about the situation and answered "No". Several were undecided, and about 85 per cent believed the answer was "Yes". A similar question on administrative ability resulted in considerable soul-searching, and only 60 per cent would say their administrative ability was respected by the Board of County Commissioners.

"How far ahead do you plan your road and bridge construction?" This one drew a variety of responses. The general lack of planning was emphasized when 25 per cent replied that no planning was done at all. Some of the counties planned ahead only 6 months to one year. Few of the counties indicated that they planned as much as 1 to 5 years in advance.

A fair liaison between Montana counties and the Montana Highway Department was indicated when 68.5 per cent showed that they conferred with the state organization in regard to their highway problems.

With reference to the desirability of a County Surveyor attending state meetings, 45 per cent knew their Commissioners would authorize their attendance at a meeting of County Engineers and Surveyors. Thirty per cent answered "No" to the question, and 25 per cent indicated that they were undecided whether their attendance would be authorized or not. However, some 61.5 per cent favored such a meeting at Bozeman. Seventy-nine per cent favored having a representative of the County Surveyors in the state meet

with the County Commissioners.

Four questions were devoted to local county finance, and the answers again pointed up the bad county situation. One county, for example, had a road budget of only \$40,000 per annum with a bridge budget of \$10,000. It was one of the counties where planning was not done ahead.

When CONTRACTORS AND ENGINEERS MONTHLY learned the result of the survey, returns had been received from slightly less than 50 per cent of the counties, and more returns were expected. However, the returns from those counties which did respond were, Linthacum believed, representative generally of conditions within the state of Montana, and perhaps in other parts of the United States as well.

Masonry-Wall Tie Resists Corrosion

A new veneered wall tie has been announced by the Copperweld Steel Co., of Glassport, Pa. Called the Copperweld V-Lok tie, it consists of a V-shaped prong of Copperweld wire and a Copperweld nail.

Made by a molten-welding process in which a thick copper covering is welded to a strong alloy-steel core, the V-Lok tie is protected against corrosion. It is unaffected by the chemical action of moisture, lime, and mortar, the company says, yet it has the strength of alloy steel.

The wide spread of the V-Lok prong anchors a large surface area of brick to studding. Its V-shape is designed to resist tensile stresses and spread strains two ways. The crimped prongs are said to anchor the tie securely in mortar. The V-Lok ties, including nails, are



Durable yet ductile, the Copperweld V-Lok tie bends easily to any angle required to anchor masonry facing to frame backing. This photo shows the tie in place—ready to receive mortar for next course of masonry.

packed together in units of 1,000 per carton.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 139.

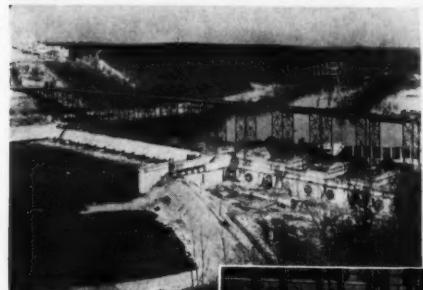
Chemical Weed Killer

A 30-page booklet on chemical weed and brush control is offered by the Chipman Chemical Co., Bound Brook, N. J. The booklet describes all weed killers made by the firm and includes recommendations for the proper application of each. Detailed data on the weed killers, applicable for roadside weed and brush control, are presented.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 5.

Wisconsin Motor Ups Norton

Phil Norton's appointment as Vice President of Wisconsin Motor Corp., Milwaukee, Wis., was announced following the annual stockholders' and directors' meeting. Mr. Norton has been with Wisconsin for twenty years and has been the company's General Sales Manager for the last ten years. He was recently elected President of the Internal Combustion Engine Institute.



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New By-Pass Is Paved Near Jackson, Mich.

Concrete Is Laid on 4½-Mile East-End Contract; Some Dual Roadway Built in the Vicinity of Interchange Structures

THE Michigan State Highway Department, Charles M. Ziegler, Commissioner, completed last year an important link on the Jackson North Belt, a new U. S. 12 route north of Jackson, Mich. This 4½-mile project covers the eastern portion of a by-pass which eventually will enable through traffic across the lower part of the state to avoid the congested downtown business section of the city. A contract for the partial grading and concrete paving of this eastern section was awarded by the Department to Lewis & Frisinger, a contracting firm from Ann Arbor, Mich.

Located just north of the city limits, the Jackson North Belt runs practically east and west on new location, tying in to the existing U. S. 12 alignment well beyond the city. The eastern part of the improvement begins at State Route M-106, an extension of Cooper Street, one of Jackson's main north-south thoroughfares, and extends eastward 4½ miles until it meets the present U. S. 12. The western portion is over twice as long, and when completed will join the old location of U. S. 12 around Parma, the first town west of Jackson.

The western section will have two grade-separation structures. Parts of this stretch have been graded, but no paving has been laid as yet. Most of the grading on the eastern end was completed in 1948 under a prior contract. Bridges have also been constructed to carry Cooper Street and Elm Avenue traffic over the new route. The remaining earth work on the eastern portion of the job was included in the Lewis & Frisinger paving contract which totaled \$518,800. Grading started late in March, 1949, with the paving getting under way by the middle of July. By October 15 the paving was completed, while the other items including curb and gutter work were finished by December 1.

Part Dual Highway

Grading and drainage in this contract included about 3,500 linear feet of roadbed at the western end. While the entire project is graded wide enough

for dual roadways, the dual sections of 24-foot pavement totaled only 3,664 linear feet; the additional pavement lane was laid at the eastern terminus and in the vicinity of the bridges. The continuous strip of concrete was laid on the south half of the roadbed.

The Jackson North Belt is constructed on a 200-foot right-of-way. The 24-foot-wide concrete pavement is 9 inches in uniform depth and is reinforced with light steel mesh placed 3 inches below the surface. The pavement pitches 1½

inches to the outside shoulder. Under the pavement is a 15-inch porous sub-base which extends one foot beyond the edges of the concrete in the fills, and goes out to the shoulder line in the cuts. Throughout the length of this job the porous material was chiefly a fine sand. Shoulders are 10 feet wide, with a slope of ½ inch to the foot. Cut and fill slopes are mostly 4 to 1.

On the dual roadway construction, the paralleling pavements are separated by an 8-foot median with flanking curb and gutter enclosing a sodded strip. The narrow transition sections to the open divisor are paved with concrete. Paving was laid to the full 24-foot width, with contraction joints at 49½-foot intervals. Expansion joints of impregnated felt are used only at the

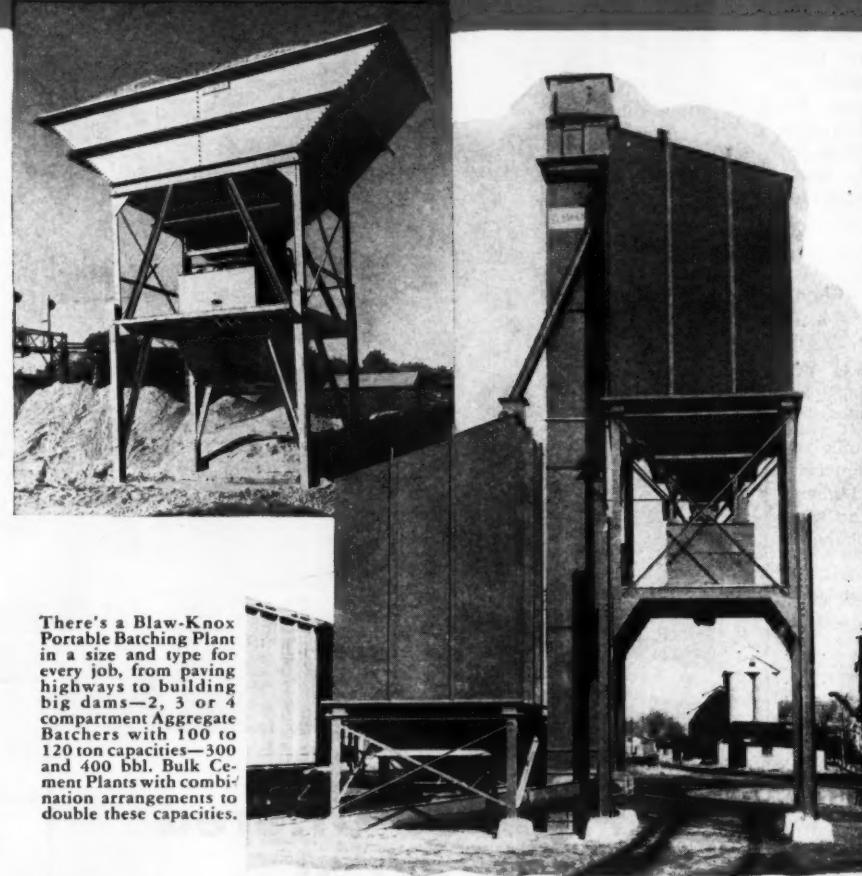
P.C. and P.T. of curves, and where the pavement meets a bridge structure. Ramps to the by-pass are mostly concrete, except at the Elm Avenue bridge where an oil-aggregate surface has been laid.

Grading Operations

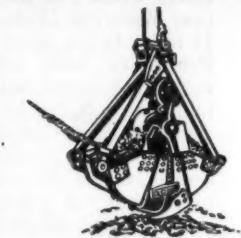
Grading items included 143,453 cubic yards of dirt and 10,634 cubic yards of rock excavation. Blasting holes in the rock were made with a wagon drill, while the digging and hauling was done by shovels and trucks. Crane-shovel rigs on the job included one Lorain 1½-yard crane, one Northwest 1½-yard shovel, and two Northwest ¾-yard cranes. Dirt was moved by six Super C Tournapulls, two 18-yard Carryalls, and

(Continued on next page)

BLAW-KNOX EQUIPMENT earns More Profit



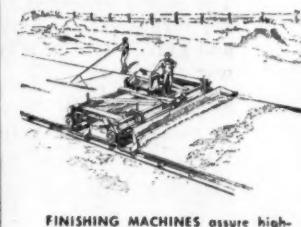
There's a Blaw-Knox Portable Batching Plant in a size and type for every job, from paving highways to building big dams—2, 3 or 4 compartment Aggregate Batchers with 100 to 120 ton capacities—300 and 400 bbl. Bulk Cement Plants with combination arrangements to double these capacities.



CLAMSHELL BUCKETS in a wide range of types and sizes for rehandling, trenching, dredging or hard digging.



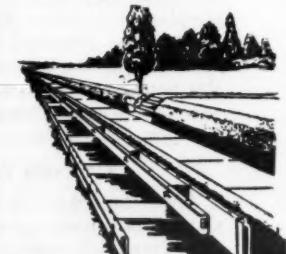
CONCRETE BUCKETS speed work, cut concrete pouring costs. Built to handle huge quantities of low slump concrete.



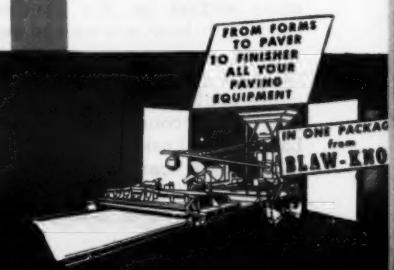
FINISHING MACHINES assure highest quality of finish of concrete pavement regardless of the type of concrete mix specified or required.



CONCRETE PAVING SPREADERS automatically spread harsh, dry mixes of two 34-E dual drum pavers no matter where the concrete is placed on the subgrade.



STEEL CURB AND GUTTER FORMS, a complete form system for every curb, curb and gutter, integral curb, special curb and sidewalk job.



STEADY consistent production at lowest possible cost—that's Blaw-Knox performance that earns you profit on every construction job. Whatever your job—building big dams or bridges, small sewers or culverts, paving super-highways or Main Street—it will pay you to put your operations on a cost-cutting assembly-line basis with the Blaw-Knox "Complete Package" of construction equipment. It contains everything you need to solve your concrete problems, from material handling to finished slab, and includes Paving Forms, Subgraders, Central Mixing Plants and the Hi-Boy Trukmixer in addition to the equipment shown here. Write for complete details or see your nearest Blaw-Knox distributor.

BLAW-KNOX

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Palo Alto California

New By-Pass Is Paved Near Jackson, Mich.

(Continued from preceding page)

two Caterpillar DW10 wagons. Six Caterpillar D8 tractors were on hand for either push loading the equipment, hauling Carryalls, or spreading the fills with dozer blades. The sand sub-base was obtained from roadside borrow.

While the grading was going on, the contractor set up a concrete batch plant just off the roadway about midway of the length of the job. Two Butler 50-ton aggregate bins were used, one for the sand and the other for the gravel, while the cement was stored in a Butler 650-barrel cement bin. A Lorain crane with a 50-foot boom and a $\frac{1}{2}$ -yard clamshell bucket serviced the gravel bin, while a Northwest crane, also having a 50-foot boom but with a $\frac{3}{4}$ -yard bucket, kept the sand bin filled.

Sand and gravel was produced by Harry Pickett at the Klump Bros. pit near Waterloo, Mich., and bulk-hauled 15 miles to the plant set-up in trucks. Peninsular bulk cement, with air-entraining agent interground at the mill, was supplied by the Consolidated Cement Co. at Cement City, Mich., 15 miles away. Trucks delivered the cement to the plant where it was put in the bin via a hopper, worm gear, and enclosed elevator. According to Michigan highway specifications, the weigh box in the cement bin was vibrated and the release controls for the discharge were electrically operated, a Jackson portable generator supplying the necessary current.

The Mix

Batches of $8\frac{1}{2}$ bags of cement were used; the dry weights per bag of cement were as follows:

Cement	94 lbs.
Sand	170 lbs.
Gravel	365 lbs.
Water	43 lbs.

The cement content of the mix required $5\frac{1}{2}$ bags for a yard of concrete. The slump averaged between $1\frac{1}{2}$ and $2\frac{1}{2}$ inches. The gradation of the sand and gravel used in a typical job batch was as follows:

Sieve Size	Per Cent Passing	
	Gravel	Sand
2-inch	100	••••
$1\frac{1}{2}$ -inch	95-100	••••
1-inch	60-90	••••
$\frac{1}{2}$ -inch	25-55	••••
$\frac{3}{4}$ -inch	••••	100
No. 4	0-8	95-100
No. 8	••••	65-95
No. 16	••••	35-75
No. 30	••••	15-55
No. 50	••••	10-30
No. 100	••••	0-10

From 6 to 12 trucks, holding two batches each, hauled the cement and aggregate. City water, tapped from hydrants, was used in the mix. Three tank trucks, holding 1,000 gallons each, carried water to a 2,000-gallon tank on a semi-trailer that moved along with the paver. At times the smaller trucks supplied the paver directly and were used when required to supply water for wetting the subgrade. A pump on the paver transferred the water from the tank trucks through a hose to the tank on the paver.

Concrete Paving

After the subgrade was shaped by a Caterpillar motor grader, Blaw-Knox steel forms, of which there were 4,500 linear feet on the job, were set by hand to line and grade. A Lakewood fine-grader, pulled by a Minneapolis-Moline rubber-tired tractor, cut out the proper cross section for the pavement. The sandy sub-base was moved easily, and also compacted well for a good foundation.

The contraction joints installed every $4\frac{1}{2}$ feet consisted of a Superior basket-type assembly holding 1 x 15-inch dowel bars on 12-inch centers across the joints. The assembly was placed on a 12-inch-wide composition



C. & E. M. Photo

On the Michigan by-pass contract, a Koehring 34-E Twinbatch paver deposits concrete between the two 24-foot lanes in a transition section to the median strip.

mat laid on the subgrade. Down the center of the pavement, $\frac{1}{2}$ x 48-inch longitudinal tie bars were installed on 40-inch centers. Finally the forms were oiled and the grade wet down in preparation for the concrete.

Mixing was done in a Koehring 34-E

Twinbatch paver having a 34-foot boom and a MultiFoote 34-E single-drum paver which was used for intersection paving, etc. Batches were mixed a total of one minute. On the 24-foot roadway the paver worked between the forms, pulling along a tail-

grader as a final check on the proper 9-inch depth. It also pulled a strike-off that leveled the concrete at a 3-inch depth for the reinforcement which was supplied by the American Steel & Wire Co. from its plant at Buffalo, N. Y.

Finishing was handled by a Jaeger-Lakewood dual-screed finishing machine, followed by a Koehring Longitudinal Finisher. Jackson and Master vibrators were used to vibrate the concrete along the forms. A center ribbon-type joint, $2\frac{1}{2}$ inches deep x $\frac{1}{4}$ -inch wide, was installed by a Flex-Plane machine. The surface of the concrete was swept with a burlap drag, and the joints were edged with a $\frac{1}{4}$ -inch-radius tool. The concrete was cured with Tru-Cure membrane compound sprayed on from a Flex-Plane machine.

Within a day or two of laying the pavement, the transverse contraction joints—2 inches deep x $\frac{1}{2}$ inch wide—were poured with Paraplastic, a rubber compound which was heated to 400 degrees F in an oil-bath kettle.

(Concluded on next page)



"Plywood Offered Best Solution to Form Problems,"

Says Seattle Architect Paul Thiry

CONCRETE surfaces for this Seattle, Washington, church had to be smoothly curved to carry out the simple dignity of the design. Architect Paul Thiry specified Douglas fir plywood forms.

"The panel material," he says, "offered a simple and most economical solution to the twin problems of smooth concrete and curved structure. Plywood is easy to use. It produces smoother surfaces with a minimum of finishing and is readily bent to the desired radius."

On small jobs and large, Douglas fir plywood has proved its ability to do the unusual and the difficult in form work. Employ its advantages to the fullest!



Church of Christ The King, Seattle—a striking departure from traditional treatment. Curved walls were formed with 4' x 8' $\frac{3}{4}$ " plywood, nailed horizontally to 2" x 12" wales, bandsawed to desired radius. Wales were placed together, 24" to 30" o.c. In no place were they sawn to less than 3 inches. Double wales were backed with 2" x 4" studs, 12" o.c. The Austin Company, Seattle, were the builders.

Douglas Fir Plywood

AMERICA'S

The concrete transition sections between the dual roadways were laid with the paver working from one of the lanes already poured. Approximately one mile of 4-inch roll curb 30 inches wide and about 2 miles of 30-inch combination curb and gutter were laid with truck-mixed concrete. The roll curb and a portion of the curb and gutter were finished by hand. The major portion of the combination curb and gutter was laid by a Dotmar curb and gutter paver.

When the paving was in full swing, the contractor laid on an average 1,250 linear feet of full 24-foot width in a 9-hour day. At the peak of operations 100 men were employed on the project.

Quantities and Personnel

The major items on the 4½-mile grading and paving contract included the following:

Earth excavation	143,453 cu. yds.
Rock excavation	10,634 cu. yds.
Concrete curb and gutter	15,756 lin. ft.
Concrete pavement, 9-inch	84,644 sq. yds.
Mesh pavement reinforcement	80,687 sq. yds.
Sodding	32,087 sq. yds.



C. & E. M. Photo
Paraplastic for transverse joints on the Lewis & Frisinger contract is heated and poured from an oil-bath kettle.

Lewis & Frisinger, the contractor, was represented on the project by George Frisinger, a member of the firm, as Superintendent.

For the Michigan State Highway De-

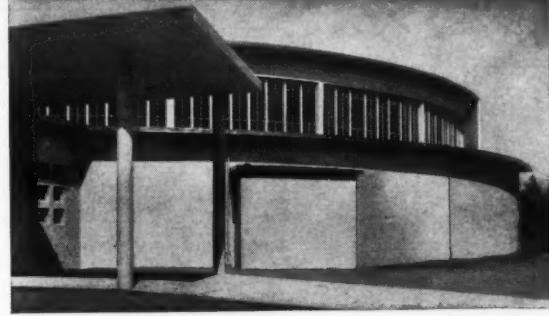
partment, Frank E. Engle was Project Engineer. The Department is headed by Charles M. Ziegler, State Highway Commissioner. H. C. Coons is Deputy Commissioner-Chief Engineer. Homer Cash is Acting Construction Engineer.

Rice Pump Now Independent

The Rice Pump & Machine Co., Milwaukee 15, Wis., formerly a division of Milwaukee Chaplet & Mfg. Co., is now a separate corporation. R. D. Houghton, Division Manager under the old set-up, is President and Treasurer of the new corporation. Erwin Losse, formerly Superintendent of the Pump Division, is Secretary, and Robert G. Rice, President of Milwaukee Chaplet, is Vice President. Mr. Houghton serves as General Manager and Sales Manager of the Rice Pump & Machine Co., and Mr. Losse is in charge of manufacturing, engineering, and product development.

The new corporation is continuing the manufacture of Rice centrifugal pumps in a complete range of sizes and models.

Smooth, Curved Surfaces Easily Achieved with Plywood



Douglas fir plywood forms were easily bent to produce the smooth curve of the outer walls. Canopy over the main entrance and the bell tower were also formed against 5/8" plywood. Concrete bands above and below the clerestory windows were formed with 1/4" plywood, backed by bandsaw 2"x12" wales and 2"x4" studs.



The half-circle shape of the structure affords a fan-shaped seating arrangement which brings the entire congregation close to the altar. Reinforced concrete construction eliminates the need for supporting columns which block vision.

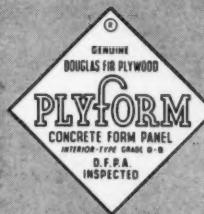
Large, Light, Strong Real Wood Panels

For additional data on Douglas fir plywood for concrete form work, see Sweet's File, Architectural, or write (USA only) Douglas Fir Plywood Association, Tacoma 2, Washington. Of particular interest are two booklets: "Concrete Forms of Douglas Fir Plywood" and "Handling PlyForm."

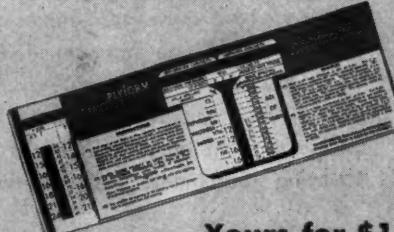
For Smooth, Fin-Free Concrete Surfaces...

PLYFORM

Concrete Form Panels



Smooth, fin-free surfaces . . . ease of handling . . . strength, rigidity, tightness . . . superior nail holding qualities . . . cost-cutting re-use factors—these are primary advantages of PlyForm. Highly moisture-resistant glues used in PlyForm panels permit multiple re-use (as many as 10 to 15 are not unusual). For the greatest possible panel re-use, however, specify Exterior-type Concrete Form grade of Douglas fir plywood—bonded with completely waterproof phenolic resin adhesive. For special architectural concrete, requiring the finest possible finish, the architect or contractor may specify Exterior-type or Interior-type Douglas fir plywood in grades having "A" face veneer—or one of the new plastic-surfaced panels.



Yours for \$1

New Keely PlyForm calculator gives construction data for plywood forms, based on hourly rate of pay. Complete with leaflet, "Design Assumptions for New Keely Calculator." Send coupon now!

DOUGLAS FIR PLYWOOD ASSOCIATION
TACOMA 2, WASHINGTON (Good in USA only)

Please send me Keely Calculators. I enclose \$1.00 each to cover costs.

Name.....

Address.....

City..... Zone..... State.....

More Tractor Power By Improved Design

Higher power-performance ratings for the International TD-9 diesel crawler tractor have resulted from new design changes in the Series 9 four-cylinder engine, announces the Industrial Power Division of International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. The TD-9 now has drawbar horsepower of 40.5, compared to 38.8 in the previous model. Maximum drawbar pull in first gear with the engine operating at maximum torque is 11,400 pounds, representing 1,150 pounds more hauling power. Travel speeds are unchanged: five forward to a high of 5.3 mph and one reverse, 1.7 mph.

Greater engine power has been obtained through a redesigned combustion system featuring new pistons, an improved precombustion chamber, simplified injection nozzles, the new Model A fuel pump, and a higher compression ratio—15.7:1 as compared to 14.4:1. In addition, the engine now has a counterbalanced crankshaft and new connecting rods.

Further information may be secured from the company by requesting Form No. A-351-NN. Or use the Request Card at page 16. Circle No. 93.

Back-Hoe Dippers

A new line of Esco hoe dippers has recently been announced by the Electric Steel Foundry Co., 2141 N. W. 25th Ave., Portland 10, Oreg. The dippers are made in sizes to fit all machines from 3/8 to 2½ cubic yards inclusive. They are built, the company points out, on a foundation of tough alloy-steel castings for lip, top and bottom corners, side cutters, teeth, stick connections, and bushings, where the greatest resistance to wear is required.

The cast alloy-steel lip has integrally cast tooth holders. Six widths of side cutters are available for each dipper size. The side cutters are interchangeable on the 3/8 to 1/2-yard, 1/2 to 2-yard, and 2 to 2½-yard dippers. Esco box-type points and adapters or Esco solid teeth may be furnished.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 113.

Impact-Type Rock Crusher

A 4-page folder describing the Jeffrey Type 303 Rock Buster has recently been issued by The Jeffrey Mfg. Co., 990 N. Fourth St., Columbus 16, Ohio. The Jeffrey crusher is of the impact type, and reduces material in suspension by means of a high-speed rotor equipped with full-width stationary hammers designed for rugged duty.

Catalog 827 points out that the breaker bars are adjustable to provide positive control over product size, ranging from 1 to 4 inches, in one pass through the crusher. Finer sizing can be secured by operating in closed circuit to pass the oversize pieces back through the crusher. Complete specifications are given for the frame construction, rotor, hammers, shafts and bearings, and the feed chute. Dimensioned drawings indicate the size and design of the unit.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 140.

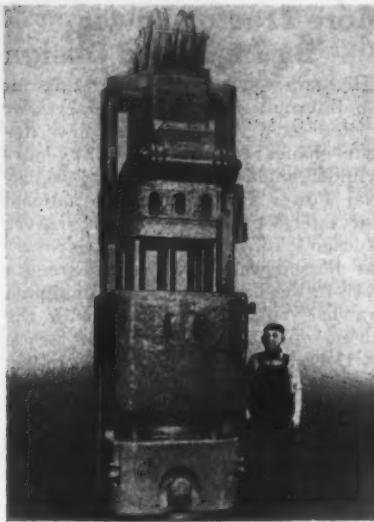
Calaveras Appointments

George Elliott has been made special salesman for the recently re-introduced white portland cement of the Calaveras Cement Co., San Francisco. He has his headquarters in San Francisco and represents the company in 11 western states.

Ernest Rohr succeeds Elliott as company representative in the Fresno area and Charles H. Laughlin has been appointed sales representative in Modesto.



BUSIEST BUILDING MATERIAL



Vulcan's new drop pile hammer and pipe cap were manufactured to drive hollow steel piles 200 feet long and 6 feet in diameter, which were required to sustain a load of 1,000,000 pounds.

Giant Pile Hammers

Two giant-size hammers, one a steam-driven and the other a drop hammer, have recently been produced by Vulcan Iron Works, Inc., 327 N. Bell Ave., Chicago 12, Ill. The steam pile-driving hammer, Size 200 C Super-Vulcan, is a differential-acting hammer with a rated striking energy of 50,200 foot-pounds. It has a total overall weight of 39,050 pounds; the weight of its striking parts is 20,000 pounds. The length of this hammer is 13 feet 2 inches.

The drop pile hammer and pipe cap, with a total weight of 81,360 pounds, were recently manufactured for driving large hollow steel piles, 200 feet long and 6 feet in diameter, which were required to sustain a load of 1,000,000 pounds. The drop pile hammer is 12 feet 6 inches high, with 78 x 11 1/4-inch jaws; it weighs 57,260 pounds. The pipe cap, which has the same size of jaws, weighs 24,100 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 44.

Improved Tire Tread

The new Hi-Miler Xtra Tred tire made by Goodyear Tire & Rubber Co., Akron 16, Ohio, retains all of the long-wearing qualities offered by its predecessor of the same name, according to its designers, but gives greater skid resistance than formerly.

The new tire has a deep non-skid surface, plus a tread contour which is wide and flat. The tread has a non-skid design of zig-zag grooves and notches which supply a multitude of road-gripping edges—an important factor in preventing the "jackknifing" of a heavy vehicle, it is explained.

Other features of the Hi-Miler Xtra Tred include the use of either rayon or nylon cord. The tire, in its latest version, is made of natural rubber. Available sizes range from 8.25 through 11.00.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 25.

Pressure-Creosoted Piles

A 16-page booklet designed to help architects, engineers, and contractors evaluate pressure-creosoted foundation piles for various types of construction projects has been issued by the Wood Preserving Division of Koppers Co., Inc., Koppers Bldg., Pittsburgh 19, Pa.

In reviewing the conditions under which wood foundation piles should be pressure-creosoted and the permanent qualities of the treatment, the booklet cites important national, regional, and city construction codes which allow pressure-creosoted wood foundation piles for permanent construction.

The booklet pictures and describes

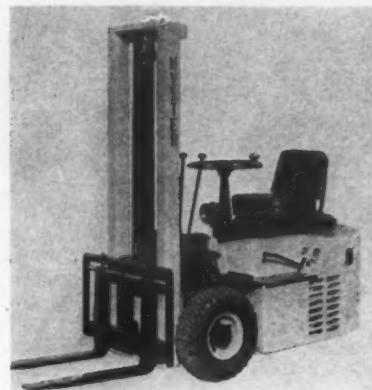
the use of these piles in major construction projects—commercial and office buildings, theaters and apartment houses, warehouses and industrial buildings, institutional and public buildings, housing projects, airports, marine construction, bridges and highway grade separations.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 107.

Small Lift Truck

A new 2,000-pound-capacity lift truck (Model 20) has been announced by the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg. Smallest in the company's line, the new machine may be fitted with the usual Hyster special-purpose attachments such as the Load-Grab, scoops, booms, guards, towing hooks, etc.

Powered by a new Wisconsin air-cooled engine, the truck operates at lower running temperatures because of alterations in design and installation of



Smallest in Hyster's line of lift trucks is the new 2,000-pound-capacity Model 20.

the engine, according to Hyster.

Uprights, slightly lower in height than on the old 20, are now mounted on an extension of the truck frame rather than on the transmission case. They are designed to pivot forward to the floor in such a manner as to lift the

front wheels clear of the ground for changing tires or servicing the power unit.

Tilt control of the uprights is now accomplished through double-acting hydraulic cylinders for both directions of tilt. This permits a slower backward tilt, less sway of uprights, and the possible pushing of a load with the truck forks.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 80.

Armco to Build New Plant

Armco Drainage & Metal Products, Inc., a subsidiary of Armco Steel Corp., Middletown, Ohio, will construct a new \$250,000 culvert-manufacturing plant on a 20-acre site at Washington Court House, Ohio. It will be fully equipped to make corrugated-metal pipe for draining highways, railroads, and airports, and for making corrugated pipe arches. This will be the 47th plant in the company's chain.



KOEHRING 16-E twinbatch provides many special operating advantages for intermediate paving and all types of concrete construction work: 60° elevating boom raises controlled-discharge bucket to a dumping height of 21 feet . . . gives complete flexibility of application for elevated pouring. 16-E *twinbatch* mixes and distributes up to 50 cu. yds. per hour, exceeding the capacity of the larger 27-E single-drum paver. Big, 92-inch wide skip raises in only 7 seconds . . . split-second Autocycle mixing is controlled by Koehring Batchmeter, saves time on every

phase of the operating cycle. As a result, the 16-E can hit a top output of 86.7 batches an hour, on 60-second mixing cycle specification. Vertical, syphon-type water tank assures consistent, maximum strength concrete . . . guarantees accuracy to meet all specifications.

In addition, the 16-E *twinbatch* rides on 6 big 11:00 x 20 pneumatic tires . . . works, travels over pavement without surface damage. Drives job to job at speeds to 6 m.p.h. . . . cuts non-productive moving time, increases work time.

SAVE TIME, MONEY with COMPLETE KOEHRING HEAVY-DUTY LINE

34-E *twinbatch* PAYER . . . for big production on highways, airports and other extensive paving contracts. Ask, Inc., about Koehring longitudinal finisher for "honey", precision finishing.

CLAMMHELL CRANES . . . draglines, shovels and hoes . . . available in 4 heavy-duty sizes: 1/2-yr., 2-1/2-yr., 3-1/2-yr., and the big 21/2-yr.

HIGH-SPEED DUMPTOR® . . . with 4-yd. rock body, has 3 speeds forward and reverse for maximum efficiency . . . 1-second gravity dump.

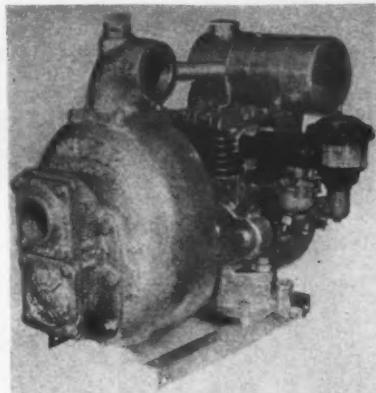
TRADEMARKS U.S. PAT. OFF. REG.

Self-Priming Pumps

Four new 1½ and 2-inch self-priming engine-driven portable pumps with capacities up to 7,000 gph have been announced by the Ohler Mfg. Co., Waterloo 5, Iowa. They are powered by 1½ and 2½-hp Briggs & Stratton engines, including the new Model 8FB.

The company's Twin Prime method is said to eliminate priming valves and gadgets and to give assurance of dependable priming. High efficiency is claimed because no recirculation occurs after the pump has picked up its prime. Dual volutes make it possible for one of the volutes to discharge at the bottom of the case, keeping it thoroughly flushed out and clean. The other volute discharges above the recirculation ports so that the entrained air removed during the priming cycle will readily separate and escape and not be recirculated so as to retard priming.

Some of the other features include a self-adjusting double shaft seal, an open trash-type impeller, a built-in large-



Ohler has brought out four new 1½ and 2-inch self-priming engine-driven pumps with capacities up to 7,000 gph.

area suction check valve, integrated close-coupled construction, flanged fittings, and a convenient carrying handle.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 86.

Lightweight Aggregate Insulates and Fireproofs

An 8-page booklet about Zonolite, a brand of vermiculite, has recently been issued by the Zonolite Co., 135 S. LaSalle St., Chicago 3, Ill. It explains that Zonolite is a lightweight mineral which can be used either alone or mixed as an aggregate with gypsum or portland cement for both fireproofing and insulating applications. The primary claim made for the product is its ability to reduce substantially the dead load in buildings as a result of its own light weight.

The folder explains how Zonolite is made, its applications, its specifications, and its fireproofing and insulating properties. Cross-section drawings and photographs illustrate its use as a dry fill-type insulation; a roof, floor, and wall-insulating concrete; an insulating and fireproofing plaster.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 102.



Sandblaster now offered in a portable model by the P. K. Lindsay Co.

Portable Sandblaster

The P. K. Lindsay Co., 97 Tilestone St., Everett 49, Mass., has recently announced that its Model CX portable sandblasting machine is now equipped with semi-pneumatic rubber-tired wheels and a removable handle. The new machine, known as the Model CXW, has a capacity of 100 pounds of abrasive. Wheels and handles are designed to give it increased mobility. A carrier to which the Model CX can be bolted is also offered.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 41.

Soil-Sampling Kit

For obtaining accurate and dependable subsurface information, the Acker Drill Co., of Scranton, Pa., offers a compact and versatile hand-operated soil-sampling kit. Enclosed in a handy steel case, the twelve soil and earth-sampling tools included in this kit can be used to obtain samples to depths of 25 feet in practically all soil and earth formations, the company says. The kit can be used for testing prior to highway and airfield runway construction, checking base materials for stabilization, and other uses.

Standard tools furnished with the kit include a heat-treated probe for simple exploration; a chopping bit and an Iwan post-hole auger for starting holes; a closed auger; a Jamaica auger; a ship auger for sampling cohesive material such as loam, clay and kaolin; a split-tube sampler; a Chicago thin-wall tube for obtaining undisturbed samples; and a dozen sample jars in addition to the necessary drill rods and fittings. When necessary, special devices can be furnished to cope with unusual situations.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 71.

Portable Power Tools

Three new circulars covering Thor Universal electric tools and drilling and contractors' tools have recently been issued by the Independent Pneumatic Tool Co., 175 State St., Aurora, Ill.

Circular JE-1148 gives complete data on the new Thor Copper Line tools. The release covers the ¼ and ½-inch drills and illustrates and describes the new drill stands available. Circular JE-1139 describes the Model 35 sinker rock drill, giving complete tool specifications supplemented by cutaway drawings of integral parts. Circular JE-1132 catalogs four Thor mining tools, describing and illustrating a new sinker leg, air bar feed, pneumatic column, and stopper leg.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 48, 39, and 32, respectively.

controlled ELEVATED DISCHARGE

FOR STREETS AND HIGHWAY WIDENING

Rubber-tired mobility of 16-E *twinbatch* permits working over streets and new pavement strips without planking. Saves time on the job, and job-to-job. Has overall width of only 8 feet, plus speeds to 6 m.p.h. for fast, self-powered moves.

BRIDGES . . .

You're not grounded with the 16-E . . . reaches up and out to discharge mixed concrete into forms, hoppers, chutes. Double-channel structural boom is 25 feet long . . . swings in a 160° arc . . . elevates 60° . . . holds firmly in any position . . . discharges controlled bucket at any height up to 21 feet.

CULVERTS . . .

For pouring culverts, and in other similar restricted areas, controlled door on bucket allows gradual discharge, prevents spillage. Clamshell-type bucket door can be opened or closed at any time, operates by hydraulic control. All operating mechanism is outside bucket, prevents clogging. Adjustable strap hangers and perfect oscillation assure vertical dumping position of bucket.

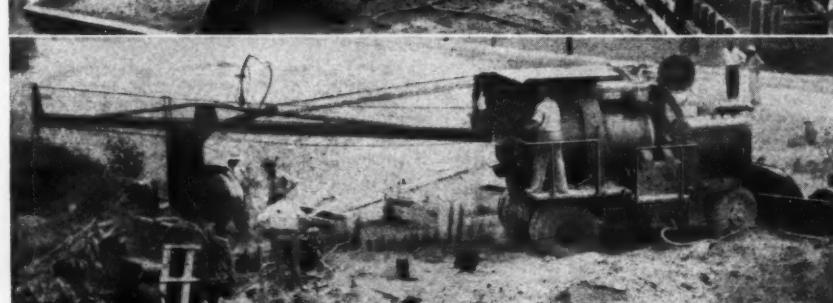
FOUNDATIONS . . .

On footings, pilings, retaining walls, etc., the 16-E *twinbatch* spots its load fast. Big bucket travels 92 feet per minute on elevated boom, 183 feet per minute on horizontal boom. 24 cu. ft. water level capacity of clamshell type bucket is more than ample for full 16 cu. ft. batch . . . plus 10% overload.

BATCHING CONCRETE . . .

The high-production 16-E also can be set up as a central mix plant. Elevated pouring makes it handy for loading trucks, and for handling a variety of miscellaneous batching applications.

It will pay you to check all the other many advantages of this rubber-tired 16-E *twinbatch*. Write for new catalog . . . or call your local Koehring distributor for complete facts.



Mail to: KOEHRING COMPANY, Dept. CEM, Milwaukee 10, Wisconsin
Please send us new 8-page catalog on the rubber-tired 16-E Twinbatch.

NAME _____
COMPANY _____
STREET _____
CITY _____
STATE _____



KOEHRING
COMPANY
MILWAUKEE 10, WIS.
Subsidiaries: KWIK-MIX, PARSONS, KOEHRING



Bureau of Reclamation Photos



Six 350,000-gpm pumps are to be installed in the Tracy, Calif., Pumping Plant. In the background of the photo at left is the long intake canal, at sea level, which will bring water to the plant. Above and right is the 100-ton Cyclops crane atop the plant which handles parts and installs the pumps.

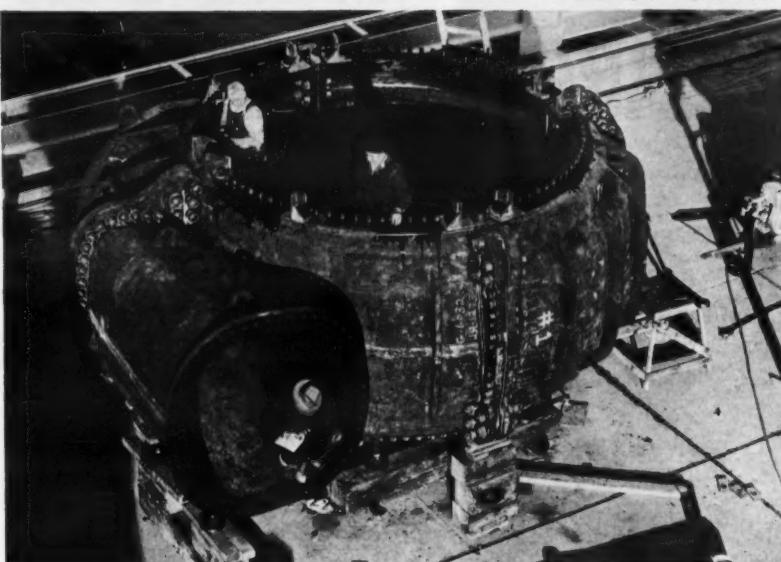
160-Ton Pumps Set In Irrigation Lift

Tracy Pumping Plant Will Be The Nation's "Second Biggest" When Huge Rigging Job Is Finished

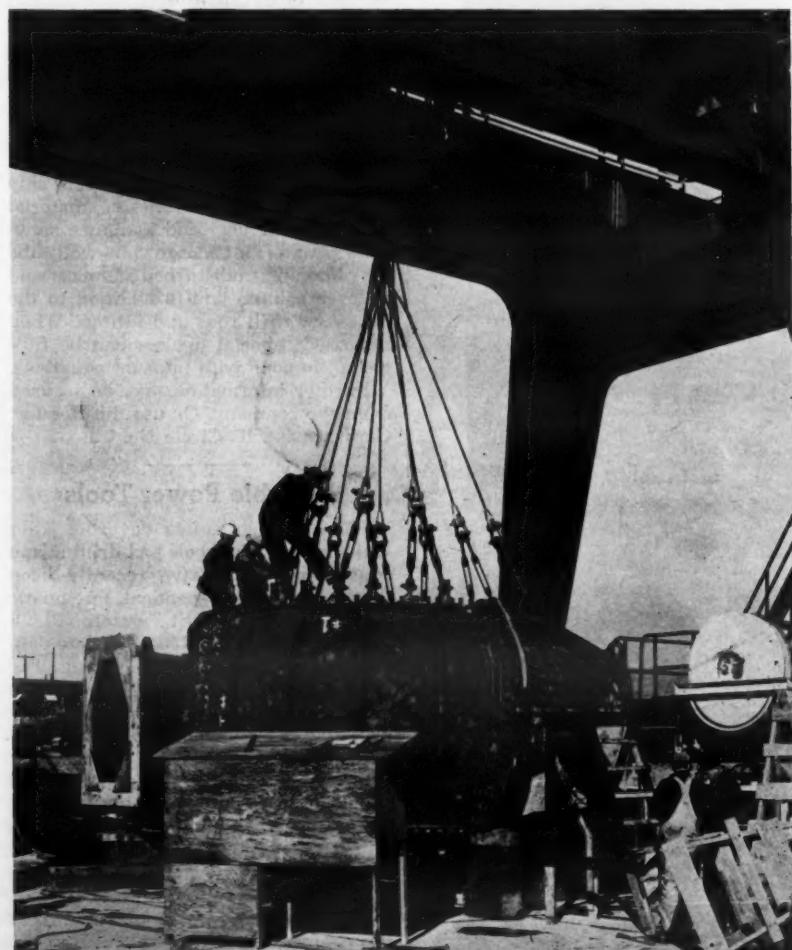
By RAYMOND P. DAY,
Western Editor

♦ A FEW miles west of Tracy, Calif., a few men and a mighty crane are erecting what will be the second-mightiest pumping plant in the nation. (See C. & E. M., August, 1949, pg. 85.) Here, under a contract with the U. S. Bureau of Reclamation, contractors are beginning the interesting installation of six 350,000-gpm pumps, which, with the 22,500-hp electric motors which will drive them, will furnish a mighty flood of water from the delta area of the Sacramento and San Joaquin Rivers. SUHB Co. is the joint-venture name

of the contractor. Four firms are represented: Stoltz, Inc.; United Concrete Pipe Corp.; Duncan-Harrelson Co.; and Ralph A. Bell. These same contractors have now finished construction of the pumping plant and nearly a mile of concrete discharge lines, laid three abreast, which connect the pumping (Continued on next page)



Each pump scroll case, composed of four sections, is assembled on top of the pumping plant and set on heavy screw-type pedestal supports.



The Cyclops crane lowers the cases into the pump pit. Cable slings fasten to special plates which fit over the bolts in the upper flange of the case.



Down below, the intake elbow has been placed and poured, and eight sets of screw-type pedestals are ready to receive the case (see top of next page).

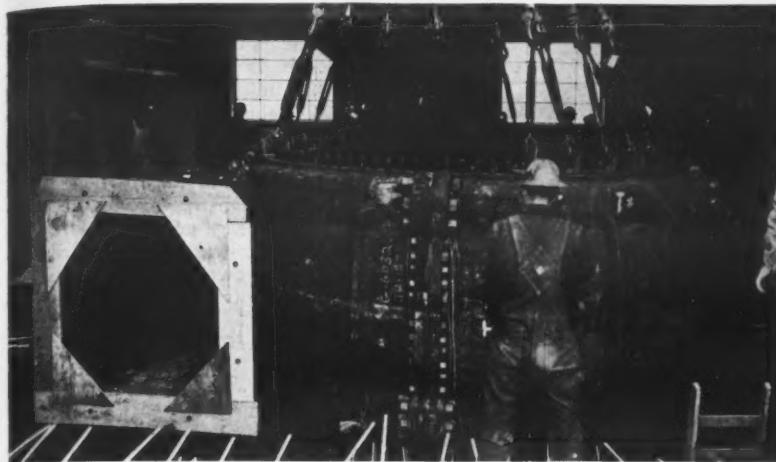
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U. S. Bureau of Reclamation Photo

The big pump is about to be set down on the pedestals which support it until the concrete which will encase it is placed.

plant to the start of the Delta-Mendota Canal.

Water which passes through the Tracy Pumping Plant will eventually be used to replace, downstream, the San Joaquin River water stored at Friant Dam and diverted for surface irrigation as far south as Bakersfield. The combined Delta-Mendota and Friant-Kern Canals will, when finished, reach a point nearly 290 miles below the plant.

Big Job of Erection

Installation of the equipment merely carries on what has been one long, tough undertaking. From start to finish the Tracy Pumping Plant has posed a series of field problems. Now, with six of the big pumps to erect and install before the motors are assembled, the contractors have a big rigging assignment on their hands. One lift alone, the scroll cases, weighs 72 tons.

The six pumps were made for the Bureau of Reclamation by Worthington Pump & Machinery Corp. Five of the large pump castings were poured at the Farrel-Birmingham foundry in Ansonia, Conn.

Each pump is an 84-inch vertical-shaft volute-type machine. Each pump is designed to handle 767 cubic feet per second against a total dynamic head of 197 feet. The big impellers, 145 inches in diameter, weigh 19 tons apiece, and are made of high-tensile bronze. The scroll cases are high-strength Meehanite metal.

Method of Setting

The 100-ton Cyclops crane on top of the pumping plant, a permanent part of the \$8,000,000 installation, is being used to install the pumps. The main hook on this crane is rated at 100 tons, while an auxiliary hook will take a 20-ton load.

Pump parts arrive at a rail siding about 2 miles from the plant. Since the heaviest section weighs about 17 tons, these are handled at the rail siding by a P & H crane. The sections are trucked in on special heavy-duty trailers, which drive in on a service road to a point underneath the Cyclops crane.

Each scroll case, composed of four sections, is assembled on top of the pumping plant. This assembly is made by the overhead crane. A special system of supporting the cases on heavy screw-type pedestal supports has been



C. & E. M. Photo

A close-up of the jacks and pedestals which support the heavy castings.

developed, and the cases are set on these supports while they are on top of the plant.

The special steel bolts which hold the

sections together have a 130,000-psi tensile strength and are being assembled to a total stress load of 30,000 pounds. This stress load is applied by

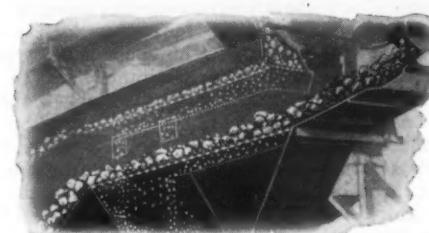
tightening the heavy nuts on these 2½ and 2½-inch bolts. The stress load is measured or determined by the elongation of the bolt. This is measured by micrometers. The accurate loading of each bolt is considered a necessity to equalize the load on the pump case.

After the scroll cases are installed in the pump pit, test heads are installed across all openings. Each pump must stand a 2-hour test of 165 psi. When the pumps stand this test successfully, the pressure is then reduced to 85 pounds while the concrete which encases the big machines is placed.

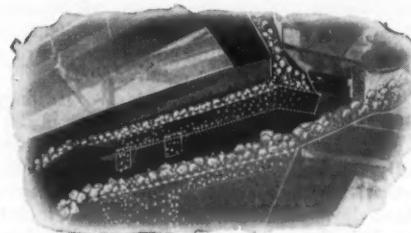
First Lift: Friday the 13th!

The first case, weighing 72 tons, was lowered to its resting place on Friday the 13th of January. Without being superstitious, men were as jittery as the uncertainties of that kind of situation could possibly make them. To add to their feeling, the place was crowded with Bureau of Reclamation dignitaries, cameramen, and contractor officials.

(Concluded on next page)



WITH BOTTOM DECK FEED only pit run is fed to the bottom deck of the 3½ deck screen. Half deck rejects sand. Pit run specification goes to pay hopper without going through a crusher... passes through only one screen. Oversize goes to jaw crusher.



ONLY CRUSHED MATERIAL is screened on the top deck. Specification material is by-passed around the bottom deck to the pay hopper. It does not pass through the bottom deck. No scalping screen is necessary. Stone chips can be produced if desired.

How a twist of the wrist increases production with BDF

IN YOUR BUSINESS, time is measured in rock and gravel tonnage. Every hour of smooth, high speed, uninterrupted production is worth many dollars and cents of profit. *Time is money.*

With the invention of Bottom Deck Feed, Pioneer engineers found an ingenious way to pack more productive hours into every working day. This is done by eliminating the necessity of frequent screen changes... by permitting continuous adjustment of balance between the roll crusher and the jaw crusher—just a twist of the wrist—*while the plant is in operation.* (See detail at right)

And because the top and bottom decks both produce specification material independently, bottom deck feed can actually double the effective screening capacity of a plant. (See details above)

If you believe "one gravel plant is as good as another", send for our catalog on bottom deck feed plants. It shows in detail how this series of portable plants will out-produce any other plants built today. PIONEER ENGINEERING WORKS, 1515 Central Avenue, Minneapolis 13, Minnesota.



THE FLOW OF MATERIAL throughout the plant is regulated by a simple ratchet adjustment on the jaw crusher. If the material is coarse and the jaw is overworked, open the jaw slightly and send a larger product to the roll crusher. If the material is fine, close the jaw. You don't have to stop the plant to change screens. A twist of the wrist does it.



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Some exclusive territories now open for dealerships.

160-Ton Pumps Set In Irrigation Lift

(Continued from preceding page)

Riggers had determined to use ten cables each $1\frac{1}{2}$ inch in diameter in order to provide an adequate factor of safety. While the scroll cases were built with lifting eyes, riggers hesitated to use them because of the excessive angle they would have to place in their cables in order to clear the available headroom under the crane.

Fred W. Doring, Erection Engineer for Worthington Pump & Machinery Corp., was present on the job. With his help, special plates were made up to fit over the bolts in the upper flange of the scroll case. These connectors were then tied to the cable slings by two heavy turnbuckles and clevises.

The first lift was made so successfully that the case rode practically level all the way down. Eight sets of screw-type pedestals had been placed in the floor, and the case was set down on these supports within a matter of perhaps an inch or two of location.

Once on location, the cases are leveled and moved around by hydraulic jacks until the pump's center line coincides exactly with a center point established on the plans. This point is determined in the field by stretching tight piano wires along two intersecting lines carefully marked by a surveyor's transit. Extreme care is used in setting the cases, because once they are set and poured the long driveshafts and electric motors high up on another floor must meet them, and still be in proper position.

The installation of cases is made to fit the flange of an intake elbow, also located carefully. According to Doring,



C. & E. M. Photo

A group photo of riggers and supervisors on the Tracy Pumping Plant job. Left to right, General Superintendent Charlie Champion, Rigger Foreman Roy Hicks, Worthington Erection Engineer Fred Doring, USBR Engineer Lee Boller, Millwright Foreman "Happy Ed" Hedlund, and Erection Foreman R. W. Busse.

the installation is the most unusual in all his experience for many reasons, not the least of which is the elevation. The center of each scroll case is set at sea level.

Ordinary sheet gasket material between the flanges was not considered satisfactory, so an improvement has been worked out. The gaskets are cut from heavy duck canvas, approximately $1\frac{1}{2}$ inch thick, and are then soaked in red lead and linseed oil. They are used by Worthington in the construction of large steam turbines, and give excellent service.

After each case is checked for position, tied down, and tested, the concrete which embeds it is then placed. Each

pump has one section which is difficult to fill with concrete, since it is formed in the kind of shape which is a natural air trap. This shape is being poured on top of the pumping plant, so that the concrete is in place when the case is installed.

Following the assembly of scroll cases, the rest of the pumps are installed in order. The impellers, driveshafts and so on will complete the pump installation, which when completed will be exceeded in size only by Grand Coulee Pumping Plant, as yet not built.

The electric motors which drive the pumps are now arriving on the project, and they will be set under a subcontract with Langlais Electric Co. of San Francisco.

Personnel

Field work is under the supervision of Project Manager George Waters and General Superintendent Charles Champion. R. W. Busse is Erection Foreman, Roy Hicks is in charge of rigging, and Ed Hedlund is Millwright Foreman.

When the plant is completed and Central Valley Project electric power is brought down from the Keswick-Shasta network, Tracy Pumping Plant will go to work. It is now planned that the first water will be delivered some time in 1951.

Air-Controlled Excavators Wheel and Crawler-Mounted

Literature describing four different types of air-controlled wheel and crawler-mounted earth excavators has recently been prepared by The Osgood Co., Marion, Ohio. Designated as Types 72, 81, 91, and 100, these units are convertible to shovel, dragline, clamshell, hoe, and crane. They have a shovel capacity range from $1\frac{1}{4}$ to $2\frac{1}{2}$ cubic yards and a dragline lifting capacity ranging between 42,000 and 127,000 pounds. Photographs illustrate the superstructure design of the excavator and job applications. General specifications for each type—in use as a Mobil-Crane, shovel, stripping shovel, and dragline—are included in the folder.

In addition to this general bulletin, specifications and descriptions of each type and the various conversions possible may be obtained by writing directly to the company.

This literature, Bulletin 4839, may be obtained from the company, or by using the Request Card at page 16. Circle No. 123.

Hydraulic Power Steering

An 8-page catalog on hydraulic power steering gear has recently been prepared by the Bendix Products Division of Bendix Aviation Corp., South Bend 20, Ind. The Bendix unit, the folder points out, incorporates a worm

and nut type of steering gear with a hydraulic power cylinder and control valve. It is a compact completely enclosed unit which is easily adapted by the vehicle manufacturer to any chassis, according to the bulletin, and it features sure and safe control as well as reduced driver fatigue and road shock. The construction and operation of the steering gear and hydraulic pump are fully explained and are illustrated by engineering drawings.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 40.

Electrode Catalog Offered

A 16-page electrode catalog is announced by Hobart Bros. Co., Troy, Ohio. It contains data on the application, welding procedure, mechanical properties, and specifications of electrodes in the Hobart line.

This literature may be obtained by requesting Catalog EW-149. Or use the Request Card at page 16. Circle No. 89.

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STEEL TAPES

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FIRST AND FOREMOST. Roe Steel Tapes are extremely easy to read... and they go right on being clearly legible year after year. The black markings are permanently etched into the steel which is then nickelplated to provide a lustrous contrasting background. A transparent plastic overcoating is added for topmost wear resistance—and durability.



Pictured here is the Roe Steel Tape #302 with polished chromeplated, sturdy welded steel case. Other Roe models feature cases in handsewn leather, and in metal-banded leather and leatherette. They have a reinforced rust resistant liner, precision winding drum, flush-folding handle, press button center and roller mouthpiece. All are available with 25, 50, 75 or 100-foot tapes; feet in inches and eighths, or in tenths and hundredths.

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Velvetouch cone clutch linings for power control units.
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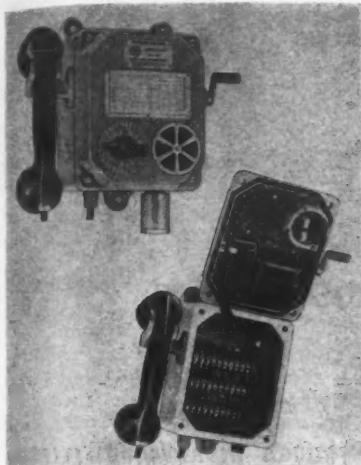
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FOR BRAKE AND CLUTCH USE **VELVETOUCH**

WORLD'S LARGEST MANUFACTURERS OF ALL-METAL CLUTCH FACINGS AND BRAKE LININGS



The voice supplies the power for this USA telephone—no battery or outside power is required for talking or ringing circuits. The telephone operates up to 30 miles.

Voice-Powered Unit For Signals and Talks

A new line of sound-powered telephones for field, tunnel, and industrial use has recently been announced by the United States Instrument Corp., 409 Broad St., Summit, N. J. Completely redesigned, these stations operate without batteries or any outside power for either talking or ringing circuits. All operating parts are mounted on the cover which lifts off, leaving the case conveniently free for installation of interstation wiring. O-ring gaskets of synthetic rubber seal all openings in the aluminum case to insure complete watertightness.

Each station consists of a sound-powered telephone hand set mounted on an aluminum case which contains a 1,200-cycle magneto generator, a howler unit with connecting horn for signaling, necessary terminal blocks, and, if selective ringing is desired, a rotary selector switch. Common-talking selective ringing systems up to 24 stations, or an unlimited number of common-talking common-ringing stations, can be used per system. These systems operate up to 30 miles, according to the company. Stations approved by the Bureau of Mines for use where explosive atmospheres are present are also available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 78.

Vibrating Screen Catalog

A guide to the selection of vibrating screens for every type of sizing and scalping operation is included in a new 20-page booklet, Bulletin No. 50, released by the Deister Machine Co., 1933 E. Wayne St., Fort Wayne 4, Ind.

The booklet contains job photographs and working information on screen sizes, production capacity, and services for applications such as sand, gravel, stone, and hot-mix asphalt. It also explains the general construction and operational features of Deister screens, and illustrates the high-capacity elliptical-throw principle embodied in Deister screens. General specifications on a wide range of screens are included.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 156.

Six Mack Men Move Up

Six Mack men have recently been promoted. A. F. Fenner, Vice President of Mack-International Motor Truck Corp., has been advanced from Manager of the Central Division to General Sales Manager in charge of the Central, Southwestern, and Pacific Coast Divisions, as well as the Republic of Mexico. E. G. Ewell, Mack-International Vice President and formerly Manager of the Southern Division, has been made General Sales Manager in charge of the

Eastern, Atlantic, and Southern Sales Divisions. P. J. Degnon, Mack-International Vice President, moves up from Manager of the New England Sales Division to Manager of the company's newly created Eastern Sales Division.

Pierce J. Fleming has left his position as Branch Manager in St. Paul to become Manager of Mack-International's Off-Highway Sales Division. C. L. Brosseau is the new St. Paul Manager. And John Walker has been appointed Manager of Mack's Off-Highway Sales Engineering Division.

Intermediate-Mix Plant For Bituminous Road Work

An 8-page bulletin on plants for producing mixes between hot-mix and road-mix has recently been released by Barber-Greene Co., Aurora, Ill. The folder is general rather than specific; instead of attempting to solve particular problems, it indicates overall methods of reducing costs with intermediate-mix construction. It considers the fac-

tors contributing to costs, quality, and application of equipment. It points out that the plants and units described produce a wide range of intermediate mixes from which to choose, and that the mixer plant can be converted to travel-plant use or a gradation unit added for high-type mixes.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 2.

Clark Heads Rosco Sales

Harold Clark, formerly Eastern Sales Manager, has been appointed General Sales Manager by the Rosco Mfg. Co., Minneapolis, Minn., manufacturer of bituminous distributors, asphalt maintenance units, road brooms, tar kettles, etc. In his new capacity, Mr. Clark will be in charge of Rosco sales in the United States and Canada.

OIL ROAD SMOOTHING Cuts Maintenance Costs As Much As 2/3 On Bituminous Surfaces

Attach it to your grader for cutting and pulverizing high shoulders and bumps, filling in depressions, and compacting the material into a new wearing surface.

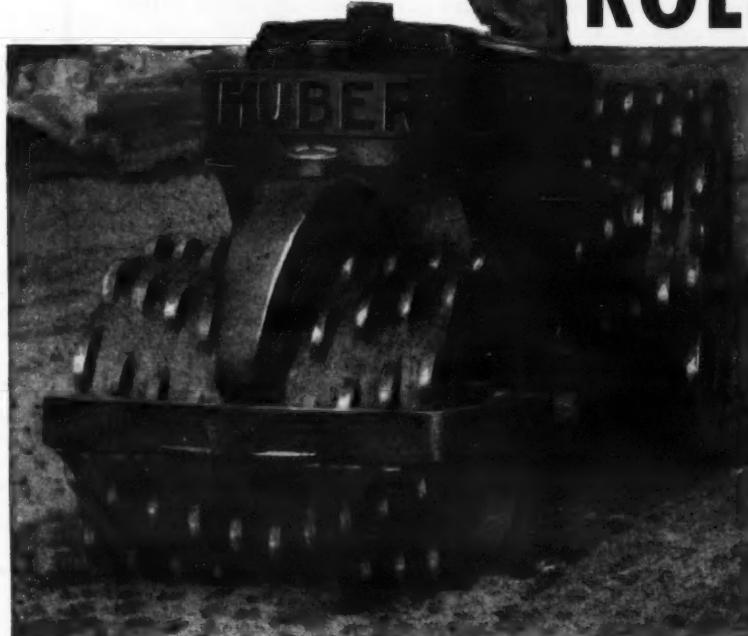
Write for circular. A few choice territories still open for good live distributors. Also manufacturers of V and straight blade snow plows, and Electra-Draulic Power Units for operating truck mounted snow plows.



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HUBER COMPACTION ROLLER...



● COMPACTION: 5387 LBS.
PER LINEAL INCH

● 118 H. P. DIESEL ENGINE

● CONVERTIBLE TO
STANDARD ROLLER

● SPEEDS FROM 1 1/2 TO
5 M.P.H. IN EITHER DIRECTION

● COMPACTS 100-150 CU.
YDS. AN HOUR AT AVERAGE
SPEED

● Here is a one-man, self-propelled unit designed to give higher compaction values than any other known commercial unit available for this purpose. With a set of standard rolls, it converts quickly and easily to a conventional 12 ton 3 wheel roller. It can become one of your busiest pieces of equipment. An independent roll-cleaning scraper is provided for each groove for positive depth of pattern. See your nearest HUBER Distributor today — or write to the factory for a copy of Bulletin H-140.





The Mandt 180-degree-swing loader has a $\frac{1}{2}$ -yard capacity and is operated entirely by four hydraulic cylinders.

Hydro-Swing Loader; Crane-Hook Attachment

A compact 180-degree-swing loader with a $\frac{1}{2}$ -yard capacity is now made by the Mandt Mfg. Co., Columbus 8, Ohio. It is operated entirely by four hydraulic cylinders which hoist and lower, swing to right or left, and open and close its bucket. The swinging boom permits loading from a 9-foot-wide swath and dumping into trucks without any backing, turning, or maneuvering of the machine. In narrow spaces, loader and truck can work in an area 15 feet wide, the company says. Bucket clearance is 8 feet 2 inches. No gear shifting is needed to reverse. The two-speed hydraulic boom provides flexibility; swing is automatically limited to 90 degrees on either side by the length of the hydraulic rams which operate the hoist deck.

The design of the boom crowds the bucket 16 inches forward into the material as it rises during loading. Maximum traction is obtained by centering machine weight and load leverage on the front drive wheels, which are equipped with large flotation tires, Mandt says. The hydraulic jack which controls the bucket enables the operator to rock the bucket to break stiff loads loose, and to change digging pitch as needed.

Speeds range from $1\frac{1}{2}$ to 15 mph. The automotive transmission, driving and steering axles, and hydraulic brakes are standard. A 1-yard bucket is available for snow and cinders. A hydraulic gooseneck crane hook attachment, of 2,000-pound capacity, can be supplied for laying pipe, placing forms and hoisting, and swinging and transporting heavy parts and materials.

Further information may be secured from the company by requesting Catalog 58-10. Or use the Request Card at page 16. Circle No. 148.

Electrode Comparisons Given on Slide-Rule Chart

A new pocket-size G-E welding Electrode Comparator slide-rule chart (Publication No. GEN-37) is available from the General Electric Co., Schenectady 5, N. Y. It lists all the company's welding rods and electrodes and indicates the type of service for which each is designed. All principal manufacturers' electrodes which are the closest equivalents for the application noted for G-E rod are also listed, the company says. Listings are suitably keyed to AWS classification numbers, and comparison data may be read directly off the slide rule. For the convenience of the operator, the AWS class designations are explained on the back of the comparator slide rule to simplify selection of electrodes.

This literature may be secured from the company. Or use the Request Card at page 16. Circle No. 88.

New Round Chain Co. Formed

A sixth Round associate chain company to be known as The Round Chain & Mfg. Co. has been formed in Chicago. General offices and warehouses are at 646 W. Lake St. John F. Ansink, former

District Manager of The Cleveland Chain & Mfg. Co., is General Manager of the new company.

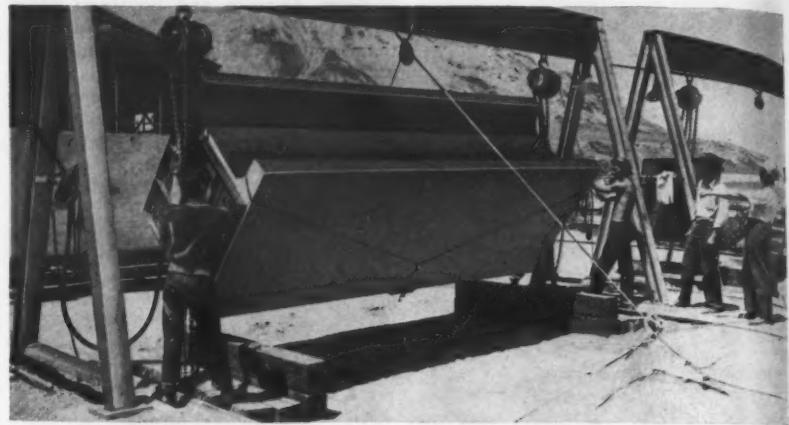
Wagon-Drill Catalog

A 10-page illustrated bulletin, No. H-1200-B36A, describing Blue Brute wagon drills has recently been made available by the Worthington Pump & Machinery Corp., Construction Equipment Sales Division, Holyoke, Mass.

The three models presented are: the UMW-40 equipped with a 4-inch cylinder bore; the UMW-35 with a $3\frac{1}{2}$ -inch bore; and the UMW-30 with a 3-inch bore. The wagon wheelbase of each model is 6 feet 3 inches.

Complete specifications of drifters and mountings are listed. Their versatility in operating positions is illustrated by a number of on-the-job photos. Features and dimensioned drawings are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 24.



TWO MEN EASILY ROTATE SEVEN-TON TROUGH WITH VACUUM LIFTER

1400 troughs were made on a three-hour schedule with all forms removed. Vacuum lifter handles any load safely, quickly, economically. Write for information.

Vacuum Concrete, Inc.

4210 Sansom Street, Philadelphia 4, Pa.

For power, for value, for every job THEY'RE GREATER THAN EVER

Year after year the nation's truck users buy more Chevrolet trucks than any other make. For every kind of trucking job they prefer Chevrolet power and Chevrolet value.

Now, Chevrolet's two rugged valve-in-head engines give more power than ever. Advance design, solid construction and low prices give Chevrolet more value than ever.

Prove it to yourself. See the new Chevrolet P-L Trucks. Check them for popularity, performance, payload and price. In 1950 they are more than ever America's best truck buy!

CHEVROLET MOTOR DIVISION, General Motors Corporation, DETROIT 2, MICH.

LEADING WITH ALL THESE PLUS FEATURES:

- TWO GREAT VALVE-IN-HEAD ENGINES: the New 105-h.p. Load-Master and the Improved 92-h.p. Thrift-Master—to give you greater power per gallon, lower cost per load.
- THE NEW POWER-JET CARBURETOR: smoother, quicker acceleration response.
- DIAPHRAGM SPRING CLUTCH for easy action engagement.
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- DOUBLE-ARTICULATED BRAKES—for complete driver control.
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- ADVANCE-DESIGN STYLING with the "Cab that Breathes".
- BALL-TYPE STEERING for easier handling.
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ADVANCE-DESIGN TRUCKS

P* Popularity Leaders

Chevrolet trucks outsell all others. In every postwar year truck users have bought more Chevrolets than any other make—proof of the owner satisfaction they have earned throughout the years.

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The new Chevrolet P-L trucks give you high pulling power over a wide range of usable road speeds—and on the straightaway, high acceleration to cut down total trip time.

P* Payload Leaders

The rugged construction and all-around economy of Chevrolet P-L trucks cut operating and repair costs—let you deliver the goods with real reductions in cost per ton per mile.

P* Price Leaders

From low selling price to high resale value, you're money ahead with Chevrolet trucks. Chevrolet's rock-bottom initial cost—outstandingly low cost of operation and upkeep—and high trade-in value, all add up to the lowest price for you.



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Integrated Planning For Complete Highway

The Role of Roadside Development in Highway Planning, Construction, Maintenance, and Safety Discussed At Short Course in Columbus, Ohio

"THE task of highway engineers is not only to provide transportation service but to do it in such a way that it will add to the nation's appearance and preserve its beauty," New Jersey State Highway Commissioner Spencer Miller, Jr., told delegates to the Ninth Annual Short Course on Roadside Development in Columbus, Ohio, March 22-26. Highway and roadside-development engineers, contractors, and other representatives from 19 states, Washington, D. C., and two provinces in Canada attended the two-day meeting, the general theme of which was "The Complete Highway".

Principal speaker at the annual dinner, Mr. Miller stated that highway officials are today standing at the bar of public judgment, for their lack of foresight and planning in highway construction in the past, the result of which is our present highway inadequacies and our roadside slums. The latter, he said, are a disgrace to America and an indication that we are a very immature people, lacking a sense of values and a realization of the attributes of a forward-looking civilization.

Mr. Miller cited the limited-access highway as the greatest single accomplishment of highway engineering. It has significance, he said, not only because for the first time controls are established, but also because it means facing the highway problem in terms of its functional aspects.

Three suggestions for the development of the complete highway were offered by Mr. Miller.

1. Those responsible for our highways must think of more than the engineering aspects. They must think too of the manner in which the highway is fitted into the terrain, and of the land use of the territory through which it passes. There should be, he said, no more straight-line highways. By conforming to the pattern of the countryside, the road will also be more attractive and much safer.

2. There should be closer collaboration among those in charge of highway work—design, construction, landscaping, maintenance. Only complete integration can produce a "complete highway". There must be integrated planning at the top level, with recognition that new highways present problems not only in engineering but also in people. Highway administrators need to be sociologists too, he added.

3. No highway department can afford to overlook the voluntary cooperation of the public. Citizen participation is the heart of the democratic process, Mr. Miller pointed out, as well as a corrective. Public support of a highway program is essential to its realization.

Finally, Mr. Miller observed, we must be more and more aware that we are not only descendants but ancestors too—we are the trustees of a great inheritance. A part of that inheritance is the countryside itself, the value and beauty of which must not be dissipated with reckless indifference. Highway officials and engineers should approach their task with a wider perspective, and see in the objective of the complete highway a kind of new synthesis to apply to planning the highways of tomorrow.

Highway Appearance

Theme of the first session was the appearance of the highway. L. G. Riley, Forestry Superintendent of the Ontario Department of Highways, presided. He

pointed out that the public now demands improvements to the roadsides as well as the roadway.

Harry Neal, Chief Engineer, Traffic and Safety, Ohio Department of Highways, told the delegates that we can't wait for the construction of future highways, but must devise ways and means of making better use of our existing roads. Furthermore, he pointed out, the more expressways we build, the less drivers will be conditioned to drive safely on the many miles of obsolete highways we shall continue to have. There is, therefore, an even greater need for delineating hazards and helping drivers to better and safer use of our roads. The means to this end include immediate elimination of hazards at locations where rate of accidents is high; more one-way streets to expedite movement of traffic; adequate marking of hazards; pavement and shoulder widening; proper signs to eliminate driver uncertainty and the element of surprise; more highway lighting; more center striping; and more study of the

human factor in accidents. Roadside development, he said, can contribute greatly in the elimination of driver fatigue.

A citizen's view of our roadsides was presented by Mrs. Frank Kirkpatrick of Frankfort, Ind. She made a plea for billboard elimination and more control over roadside use through zoning.

New Jersey's highway planting design and practice were discussed and

illustrated with colored slides by Oliver A. Deakin, Parkway Engineer, New Jersey State Highway Department. More attention should be given to the conservation of natural growth, Mr. Deakin said. Such planting as is done should repeat or emphasize the existing growth, using the plant materials which thrive in the locality.

He warned against overplanting at
(Continued on next page)



**LANSING F4-1/2
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The most popular wheelbarrow on the market for handling wet concrete. Ask your dealer or write direct to Lansing or one of our warehouses.

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- ★ Full Payload Every Time . . . FOR MORE PROFIT.
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- LS . . . A lighter weight bucket designed for levee and drainage work.
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HENDRIX
Lightweight **DRAGLINE
BUCKETS**

HENDRIX MANUFACTURING CO., INC.

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For descriptive literature ask your dealer or write

Integrated Planning For Complete Highway

(Continued from preceding page)

bridge structures and suggested that some of the masonry be allowed to show. The slopes should be stabilized, however, and the wing walls blended into the surrounding terrain.

In the location of new highways, New Jersey is now following the natural contours of the land, instead of using straight-line design. Mr. Deakin stressed the importance of changing vistas to avoid monotony. This, he said, increases both the safety and the recreational value of the highway.

Highway Safety

Although safety was discussed throughout the meeting, it was the special subject of the second session, at which A. C. Dunn, Chief of Design, Division 2, Bureau of Public Roads, presided.

Sergeant E. E. Smith of the Ohio Highway Patrol called attention to the importance of driver safety education. The No. 1 cause of accidents, he said, is speed excessive for existing conditions. Of all fatal accidents, 40 per cent are single-car collisions. He showed an excellent safety film entitled "Traffic With the Devil" which is being used in Ohio's driver-education program.

"Roadside Control or Roadside Chaos" was discussed by David R. Levin, Head, Special Administrative Studies Unit, Division of Financial and Administrative Research, Bureau of Public Roads. Mr. Levin stated that roadside control involves four problems—safety, highway capacity, efficiency of highway travel, and aesthetics. Studies in Michigan have shown that roadside conditions have a definite relation to accidents. Especially on old narrow roads, roadside use—the number of driveways, exits from roadside establishments, etc.—definitely cut down road capacity. The frequent stops and starts such roadside conditions necessitate not only decrease the efficiency of highway travel but increase operating costs. For example, each time a car is stopped, enough rubber is used to carry a car a mile; each stop and start requires enough gasoline to take a moving car two blocks. It would be better, Mr. Levin suggested, to spend money on roadside improvement instead of car operation.

Highway management must become interested in the solution of the roadside problem, he said. There are several means of roadside control:

1. Expressways, with complete control of the roadsides. But at best there won't be an extensive mileage of these.

2. Control by agreement, such as Ohio's reservation agreement whereby the property owner—for a small sum—agrees not to erect structures or establishments along the roadside.

3. Zoning—an excellent institution but with definite limitations. At present, it must be done by local units, and is a frail device since a change in administration may mean a change in zoning ordinances.

4. Marginal land acquisition—limited to those states having enabling laws. On a large scale, it is expensive and ties up too much money.

There are, however, several administrative measures which can be taken.

1. Development of highway department standards for private driveways and entrances to state highways.

2. A permit system for access to state highways. More than half the states have some such system but it should be enlarged and administered by the planning bureau.

3. State roadside surveys. These will provide needed facts about roadside conditions and their relation to accidents, highway capacity, and efficiency. A study in the Detroit area revealed that there is a greater correlation be-

tween roadside conditions and accidents than there is between design features and accidents.

Conservation, said Wilbur H. Simonson, Chief, Roadside Section, Bureau of Public Roads, is saving and making the most of what exists. Conservation of all our resources is vastly important today. For every mile of highway, there are 2 miles of roadside, he said—and roadside development, which became a part of the highway picture last, is fast becoming "first" in importance.

Mr. Simonson showed a number of slides, tracing the history of roadside conservation. He called attention to its public relations value, the value to property owners, and the need for careful engineering procedure. Efficient results can be achieved only by know-

ing and understanding existing conditions. The complete highway, he said, means a completely integrated development.

Highway Maintenance

The contribution of the landscape engineer to economy in highway maintenance was outlined by John L. Wright, Roadside Development Engineer of the Connecticut State Highway Department. Flat, well rounded slopes, erosion control through slope stabilization and turf establishment, and the development of special seeding, mulching, and other equipment have lowered highway maintenance costs. But, said Mr. Wright, the maintenance engineer today has a bigger problem than ever before in maintaining our aging highway system

in the manner demanded by the traveling public. Although the landscape engineer may justly be proud of his accomplishments, he cannot rest on his laurels. Rather, he must face squarely the challenge of present-day highway problems and bend every effort towards greater mechanization and even more efficient methods to lower both roadway and roadside maintenance costs.

Without good seeding practices, highway travel would be more dangerous and less restful, and roads more costly to maintain, said J. W. Lentz of O. M. Scott & Sons Co. Mr. Lentz reviewed the various types of grasses suitable for roadsides, and outlined proper soil preparation and seeding methods. He

(Concluded on next page)

The New INTERNATIONAL TD-24

HERE'S WHAT THE TD-24 CAN DO

INTERNATIONAL

INTERNATIONAL HARVESTER

Positive all-weather starting on gasoline, with quick change-over to full diesel operation, all from the seat.

Separate reverse lever for quick change of direction. The tractor moves in the direction the lever is moved.

Self load and run with scrapers of 17-yard capacity—and shift gears on-the-go with the rolling load.

Cut waste shifting time out of work cycles; provide the best speed for every operation, 8 speeds in each direction!

INTERNATIONAL

described some experiments with asphalt mulch, recommending the use of emulsion rather than cut-back. Although the first cost is higher, Mr. Lentz believes that asphalt mulch has some advantages, particularly in the late autumn or early spring because of the protection it affords the seed.

Sidney Walsh, Landscape Engineer of the Washington State Highway Department, described the wire-tied straw mats used in his state on very steep cut and fill slopes where the terrain precludes slope flattening. These mats are made up at the site of the work, using rain-spoilt hay. They are 20 feet long and about 2 inches thick. Two wires running longitudinally on both sides of the mat are tied at 18-inch intervals to hold the hay in place. The

mats, which weigh about 23 pounds, are pegged at the top of the slope. Mr. Walsh reported a long-range saving through prompt erosion control and lower maintenance cost.

The closing feature of the meeting was a report by all states represented on their roadside-development activities. Torbert Slack, Roadside Development Engineer of the Louisiana Department of Highways, presided.

The state reports indicated an emphasis on the transfer of roadside development from maintenance to design departments; erosion control measures; the establishment of more roadside parks or rests, in accordance with public demand; and greater mechanization of roadside work, through the adaptation of existing equipment or the

development of special machines, to cut labor costs.

Inspection Trip

A regular feature of the Short Course is an inspection trip. This year's trip was to the southwestern part of the state, where typical slope-stabilization and erosion-control projects and a number of roadside parks were inspected. An interesting visit to the plant of the J. Chas. McCullough Seed Co. in Cincinnati was included.

The Annual Short Course on Roadside Development is sponsored by the Ohio Department of Highways and Ohio State University. This year's program was arranged by Professor Charles R. Sutton, Department of Landscape Architecture of the University, and

W. J. Garmhausen, Landscape Architect of the Department of Highways.

Liquid Guards Skin Against Poison Ivy

For highway maintenance and contracting crews who have to work along fence rows or brush stands, poison ivy and poison oak present a hazard. The Milburn Co., 3246 E. Woodbridge St., Detroit 7, Mich., manufacturer of a line of dermatitis-preventive creams and liquids, makes a product specifically designed to reduce time lost as the result of ivy or oak poisoning. Exposed skin can be made immune to the oil of the ivy leaves, which cause the irritation, by application of a Ply liquid before starting work, the company says. This liquid is greaseless and will last for 6 to 8 hours if the skin is not washed. At the end of the day, washing with soap and water will quickly remove the protective coating, according to the company.

The Milburn Co. reports a drop of 50 per cent in ivy poisoning, due to applications of Ply, among highway department employees in one of the eastern states. The persistence of some cases, the company says, was due to infection from contaminated clothing which was removed after the Ply protection had been washed off. Effective controls for clothing, says Milburn, will result in a further drop in ivy poisoning.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 63.

CHAMPION of Crawlers

"The TD-24's work right along on slopes so steep we have to cut them down before other tractors can climb them even without loads," says Bob Rardin of

Rardin Brothers, Akron, Ohio. "They are fast tractors, easy to shift and have plenty of power. This combination really moves dirt." His TD-24 was equipped with a bulldozer.

"It will out-buck any tractor I've ever run," says Harold Wooley's operator, Drain, Oregon, "and sure push dirt up hill—and climb steep grades." His TD-24 works regularly on 30% to 50% grades, building mountain roads.

"I wouldn't have anything else," says another Oregon operator. He works for V. R. Russell &

Sons of Valsetz. "It's sure fine on bulldozing; best dirt mover I ever got hold of."

That's the way owners and operators talk about the International TD-24 Crawler. It has earned their praise, for it does everything any other big tractor can do, *plus many things that NO other tractor can do*. The TD-24's versatility makes it the most useful and profitable earthmover in any equipment line-up.

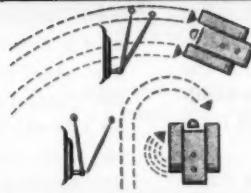
Visit your International Industrial Power Distributor for a demonstration. Then ask yourself how long you can get along without this big red worker and the extra earnings it will produce.

INTERNATIONAL HARVESTER COMPANY
Chicago

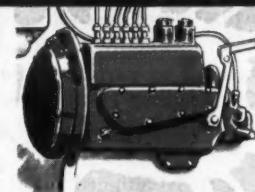
TD-24 CAN DO FOR YOU



Instant speed change up or down one speed, or stop, without declutching. Planet Power drive does it!



Planet Power steering puts turns with power on both tracks, feathered turns and pivot turns at your fingertips.



Torque Control feature of fuel injection pump increases engine torque when needed to overcome overloads.



Work on grades up to 100%. Its power, ground contact, balance and lubrication are right for licking any grade.



Handle heaviest loads on gradual turns as easily as straightaway because both tracks are powered in the turn.



Push or pull through tough going. The engine delivers extra "power" when its r.p.m. is pulled down by load.

INDUSTRIAL POWER



Road Widening Equipment

A 12-page catalog describing a full line of road-widening and base-paving equipment has recently been offered by the All Purpose Spreader Co., P. O. 105 Fuller Road, Elyria, Ohio. Featured in the new bulletin are Apsco wideners, trench rollers, widening chipper, spreader, and base paver.

The wideners are available in three models, the largest of which lays up to 10-feet widths. The literature points out that the hydraulic controls on the strike-off gate permit easy and accurate regulation of strip widths—going around curves, etc. On-the-job photographs show the Apsco handling concrete, bituminous mix, stone, dirt, and gravel. Full specifications and construction features are also given.

The Apsco trench roller, a companion piece for the wideners, is available with either a 60 or a 72-inch-diameter compression roll. The 20-inch-wide roll is said to have a compression in excess of 300 pounds per linear inch. The out-of-trench steering wheel and other features are highlighted. A 3-ton 32-inch-wide tandem roller is also presented.

Description of the Models P-120 and P-125 base pavers are given, along with field photos, specifications, and features of each. The larger P-125 has a spreading width of 8 to 12 feet, a controlled depth up to 12 inches, and a capacity of 150 tons per hour, according to the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 6.

Pamphlet on Diesel Engines

The "GM Diesel Quiz", a new pamphlet describing features, characteristics, and applications of the General Motors diesel engine, has been put into circulation by the Detroit Diesel Engine Division of the General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich. In questionnaire format, the "Quiz" gives simple easy-to-understand answers to 17 basic questions about the design and operation of GM diesel engines.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 14.



The Wills ditcher is designed for quick mounting on the back of Ford, Ferguson, and Ford-Ferguson tractors.

New Tractor Ditcher

A new lightweight ditcher for use with Ford, Ferguson, and Ford-Ferguson tractors has recently been developed by Wills Motor Center, P. O. Box 12, Topeka, Kans. Designed for quick mounting on the back of the tractor, the new unit has a digging depth of 5 feet—7 feet with a booster kit—and a swinging arc of 170 degrees. Standard dipper width is 16 inches, but dippers can also be obtained in 10, 18, 20-inch widths to give a capacity range of from 2 to 5 cubic feet.

Applicable to a variety of digging uses, the Wills ditcher has a 3-gear 12-gpm hydraulic pump with self-centering built-in relief valves. Bushings are all Zerk-fitted, according to the company. Average digging rate is 50 linear feet an hour at 5-foot depth, Wills says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 114.

Year-Round Lubricant

A new high-quality oil for hydraulic motors, pumps, and similar equipment, Gulfite 5W, has been introduced by the Gulf Oil Corp., Gulf Bldg., Pittsburgh 30, Pa., for use under extremes of heat and cold. With a viscosity of 90-100 S. U. S. at 100 degrees F, the oil, Gulf says, maintains its body, heavy load-carrying capacity, and non-foaming and free-flowing characteristics throughout the entire range of temperature in which equipment is normally operated. Tested in the laboratory and in the field, it makes possible the use of one year-round lubricant, it is reported.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 29.

Scraper Buckets Described

Catalog 19, Section J, recently issued by Sauerman Bros., Inc., 564 S. Clinton St., Chicago, Ill., presents a full line of Crescent scraper buckets, standard as well as special designs. Typical uses of this equipment are depicted by action photographs on many types of work.

The 14-page catalog explains that Crescent buckets are grouped according to uses: Lightweights, for excavating materials weighing up to 100 pounds per cubic foot; heavyweights, for 130-pcf material; Mammoths, scraper buckets of unusually large sizes; Bulldogs, for rock handling; and Specials, adaptations of the Crescent design for out-of-the-ordinary problems. Specifications and descriptions are given in sizes ranging up to the 15-cubic-yard Mammoth.

This literature may be obtained by writing to the company.

Kinney Branch Office Moves

Spring time is moving time in Chicago. Kinney Mfg. Co., Boston, Mass., maker of rotary and vacuum pumps and bituminous distributors, has moved its Chicago branch office from the Socony-Vacuum Building, 59 E. Van Buren St., to Room 1313, People's Gas Building, 122 South Michigan Ave.

Portable Generator Produces 400-Watts

Designed for applications needing a portable source of electric power, a new 400-watt 60-cycle ac electric generating plant has been developed by D. W. Onan & Sons, Inc., Minneapolis, Minn. Adapted and equipped to operate low-wattage motor-driven equipment, the new Model 04AH, it is claimed, will operate for 5 hours on one gallon of gasoline. The unit is 19 inches long, 14½ inches wide, and 16½ inches high.

The 4-cycle air-cooled Onan engine used for the 04AH is said to be built for heavy-duty electric plant service. All AH models are equipped with inherently regulated generators. Designed for operation under all climatic conditions, they are directly connected to the engine for permanent alignment.

The units are available in either portable, manual, or remote-starting models. The manual plants are started by pull-rope. Supplied with current from a 12-volt automotive-type storage bat-

tery, remote-starting models are electrically cranked with the generator serving as a motor. In addition to the start-stop buttons located on the plant, additional start-stop stations may be installed at any convenient point within 250 feet of the unit.

Further information on these generators may be secured from the company. Or use the Request Card at page 16. Circle No. 69.

Paris Joins Marlow Pumps

Fred R. Paris has a new position as District Representative for Marlow Pumps, Ridgewood, N. J. He works out of the home office and is in charge of construction pump sales in New York State and part of Canada. Before joining Marlow, Mr. Paris had been with Worthington Pump & Machinery Corp. for 10 years.

"BERG" Concrete Surfacer

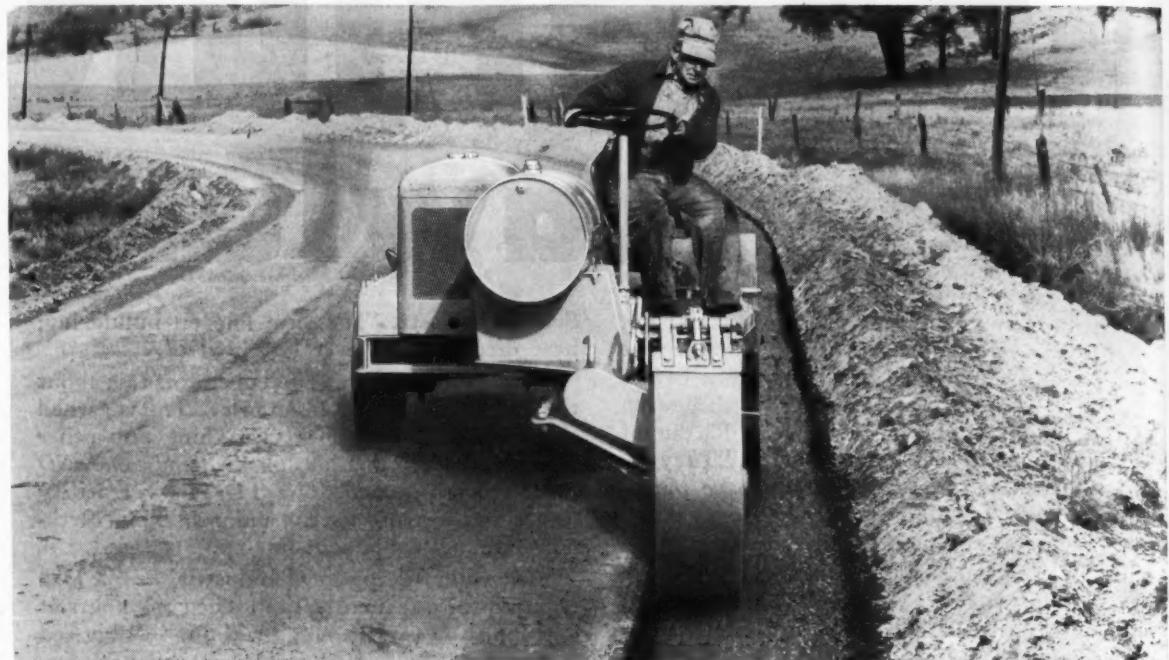


The Concrete Surfacing Machinery Co.
4665-4669 Spring Grove Avenue, Cincinnati 32, Ohio

A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R-2 Right Angle Head and Model AS Motor Unit.

Ideal for surfacing concrete construction and other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for internal vibration by substituting the Model V2 Vibrator Unit for the above Head.



ROAD WIDENING -----→ MADE EASY

Road widening came under the heading of "better solution wanted" back in the days when trench compaction meant costly hand-tamping—or using a 3-wheel roller at precarious angles on work it was not designed to perform. Today, thanks to the Buffalo-Springfield TR3-B Trench Roller, the headaches and hazards have been largely removed from this type of work.

The specially-designed TR3B trench roller has a 16" wide compression roll* which works in the trench. The large diameter of this roll prevents shearing or pushing of surface materials; insures an even penetrating compaction. Likewise, means are provided to increase the weight of the roll to produce compressions in excess of 325 lbs. per inch of roll face width.

*20 in. wide compression roll also available.

The roller is kept on a level plane by means of a small-diameter road wheel, which is raised or lowered hydraulically to suit the depth of the trench. The wheel control valve is conveniently located at the operator's station, permits him to hold the roller on a level plane while working in trenches up to 16" deep. Automotive-type steering and a compact instrument panel further simplify control.

Built with an eye to economical performance and low maintenance costs, the TR3B has increased production and trimmed operating costs on all types of trench compaction. If road widening looms prominently in your job picture, it will pay you to learn more about the Buffalo-Springfield Trench Roller from your nearest distributor. See him today.

BUFFALO SPRINGFIELD
THE STANDARD OF COMPARISON
SPRINGFIELD, OHIO

Mail This Coupon Today

THE BUFFALO-SPRINGFIELD ROLLER CO.

Dept. F-5, Springfield, Ohio

Please send me Catalog S-53-48 describing the right models for my requirements.
 Notify distributor to call.

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A New Convertible One-Yard Excavator

Convertible to various front-end combinations, the new 1-cubic-yard Type 43-M manufactured by Marion Power Shovel Co., Marion, Ohio, serves as a shovel, dragline, clamshell, crane, backhoe, and pile driver. Front-end changeovers in the field can be made quickly and easily, Marion says, and simplicity of design eliminates the need for machinery, lagging, or sprocket changes in making conversions. A single boom can serve for both shovel and backhoe work, but a gooseneck boom is optionally available. A single boom with butt-jointed sections is used for dragline, clamshell, crane, or pile-driver service.

Features of the 43-M include simply designed and easily accessible machinery; 22 critical friction points equipped with ball or roller bearings; shafts made of alloy steel; heat-treated machine-cut gears; drums of alloy cast steel; independent chain crowd; Marion air control system; independent boom hoist with overrunning clutch, holding brake, and safety ratchet; oversize slow-speed compressor; and lubrication fittings grouped at points of easy access.

The 43-M's lower frame and crawler assemblies combine cast and welded construction. Crawler rollers are shielded from dirt and the crawlers are said to be self-cleaning and non-clogging. The swing gear has machine-cut hardened teeth and the swing roller path is extra wide to accept the six large-diameter swing rollers.

Further information may be secured from the company by requesting Bulletin No. 400. Or use the Request Card at page 16. Circle No. 51.

Data on Steam Generators

Seven new catalogs describing the complete line of York Power Steam-Pak generators have recently been issued by York-Shipley, Inc., 254 Jessop Place, York, Pa. They cover the gas-fired N Series for natural, manufactured, or mixed gas; the oil-fired 3 Series for light fuel oil; the combination-firing N3 Series for No. 3 oil and gas; the oil-fired 5 Series for No. 5 fuel oil; the combination-firing N5 Series for No. 5 oil and gas; the heavy-oil-fired 6 Series for heavy Bunker C oil; and the combination-firing N6 Series for No. 6 oil and gas. The catalogs list descriptive specifications, capacities, dimensions, and all operating features of the Steam-Pak generators.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 119 and specify the series in which you are interested.

Heads Nelson in Washington

Jack Godley has been promoted from Field Engineer to Manager of the Washington office of the Nelson Stud Welding Division of Morton Gregory Corp., Lorain, Ohio. As Manager, he coordinates all work with Government services, agencies, and bureaus which involves stud-welding applications or specifications. Mr. Godley has been with Nelson since 1946.

WILLIAMS "SUPER-HI" TENSILE STEEL

Concrete Form Hardware
Clamps—Tie Rods—Couplings
and Pigtail Anchors

GREATER SAFETY
LESS WEIGHT TO HANDLE
INVESTIGATE WILLIAMS ECONOMY

WILLIAMS FORM ENGINEERING
CORP.

1501 Madison Ave. Grand Rapids 7, Mich.
Phone 5-9208



Shown here equipped as a dragline is Marion's new Type 43-M machine, convertible also to shovel, clamshell, crane, backhoe, and pile-driver service.

Pavement-Repair Trucks, Asphalt Plants Described

A catalog describing White asphalt plants and pavement-repair trucks has recently been offered by the White Mfg. Co., Elkhart, Ind. Both the Model L-12, a 15-ton-per-hour plant, and the L-25, a 25-ton-per-hour plant, are fully described.

These plants, the literature points out, make bituminous mixes for immediate hot application or plant-prepared mixes for deferred cold laying. They produce coarse mixes for base and fine mixes for sheet top.

Two completely portable pavement-repair trucks are also described. These Models L-8 and L-4 have rated capacities of 10 and 5 tons per hour respectively. Other equipment presented in the circular includes material driers, pugmill mixers, and aggregate feeders.

This literature may be obtained from the company by requesting Circular 39, or by using the Request Card at page 16. Circle No. 56.

NEW and Heavy-Duty Engineered TO SAVE YOU MONEY



Whether you haul by the yard or by the ton

You get lower-cost performance, more miles of trouble-free hauling, and longer life from every new International Truck because every new International Truck is **HEAVY-DUTY ENGINEERED**.

Proof of this statement boils down to this:

1. Heavy-duty truck buyers keep records of hauling costs right down to the last penny. On the basis of what these records show, these cost-conscious men have bought more heavy-duty International Trucks than any other make for 18 straight years.
2. The extra values that for almost two decades have assured America's most exacting truck buyers performance at lower cost per mile are engineered into every new International Truck from the smallest to the largest.

Every new International Truck from 4,200 to 90,000 pounds gross vehicle weight offers heavy-duty engineered stamina and operating economy combined with new comfort and ease of handling.

You get new comfort and driving ease in the "roomiest cab on the road." Step into the Comfo-Vision Cab

and discover how much more "move-around room" there is in the "roomiest cab on the road." Note how easy it is to adjust the wide seat to just the right position.

Look out through the one-piece, scientifically curved Sweepight windshield. Place your hands right where they feel natural for driving—and you'll find them gripped around the sturdy steering wheel. And just wait till you start going—you'll enjoy more positive control... thanks to new Super-steering.

You get more all-round truck value in every new International Truck. See the new valve-in-head truck engines, new rear axles, new features throughout—all proved under actual operating conditions. Get the facts about new Internationals—the world's most complete line of trucks.

See for yourself... see your International Truck Dealer or Branch, soon.

International Harvester Builds McCormick Farm Equipment and Farmall
Tractors... Motor Trucks... Industrial Power... Refrigerators and Freezers
Tune in James Melton and "Harvest of Stars"—NBC, Sunday afternoons



ALL NEW, ALL PROVED
INTERNATIONAL TRUCKS
INTERNATIONAL HARVESTER COMPANY CHICAGO

New Device Measures Penetration of Piles

Most construction supers will agree that marking off piles at intervals and counting the hammer blows delivered to sink the pile from one mark to the next is not in all respects a satisfactory method. Human errors can always creep in, and final results usually depend upon the sustained accuracy of measuring and reporting.

To eliminate human errors, the Penetrometer, an automatic electronically operated gage designed to measure and record the penetration of the pile from each successive blow of the driving hammer as it occurs, has been developed by A. Byron Hunicke, Drury Lane at Wimbledon Drive, Spring Hill, Ala. The automatic recording is accomplished by inserting a specially designed follower between hammer and pile. Built solidly into this follower is a hollow cylindrical electric coil enveloping a strong magnet; the magnet is free to move up and down the vertical axis of the coil.

The two leads, contained in an all-weather cable, connect the coil to a pen of a standard single-channel oscillograph, through a rectifier. A change in position of coil and magnet relative to each other, such as occurs when the hammer bounces off the pile top, sets up an instantaneous current which deflects the pen of the oscillograph proportionately. Mr. Hunicke, the inventor, points out that the circuit can be of any desired length; the oscillograph may therefore be in the cab of the pile driver or at any other convenient place. The pen writes continually on a moving strip of paper.

The chart paper in the oscillograph is driven by a small motor consuming about 56 watts. The power line can be plugged into an electric light socket or, where no electricity is available, an automobile battery and inverter will do. The paper is graduated longitudinally in centimeters, and normal travel is one centimeter per second. Oscillograph speed can be reduced to obtain shorter charts or increased for a "blow-up" of some particular reading. Graduations across the chart paper are in millimeters.

The oscillograph is calibrated for a given hammer with the first pile driven. Then from this a master curve is obtained, relating pen deflections in millimeters to fractions of inches of penetration. Re-calibration is made if the hammer is changed. The penetrations in inches may simply be written in on their corresponding millimeter lines on the chart paper and read direct if desired. The charts are easily photostated or blue-printed for duplicate records.

With this device the designing engineer may predetermine what maximum penetration is permissible, in fractions of an inch per blow, as soon as he knows the characteristics of the hammer to be used. He can inform the contractor of the penetration limit which can be converted from a master chart to a millimeter pen deflection. When the pen deflection consistently reads below the desired figure, the crew moves on to the next pile. Since the charts are visible at all times, the engineer can see for himself exactly how near to the specified figure the work is getting. Copies of the charts delivered to the engineer daily will reveal whether or not the specification is being met. When the specifications cannot be met, this will appear forcefully and at once, give both contractor and engineer evidence upon which to base such changes in design as may be indicated by the findings.

Since all of the readings can be made the same way by the same machine, all are comparable, there are no errors of human judgment, no penetrations are missed, no blows unaccounted for.

An interesting sidelight on pile driving with the Penetrometer is the log of

oscillograph readings constructed by plotting the pen deflections in their sequence and connecting their tips to show the difference in soil resistance of various strata. A further step converts each reading to its corresponding penetration in inches. Plotting these figures reveals the approximate depths of fault lines between zones of soil of different sustaining value. When motion of the pile between blows is accounted for, such figures can be made precise and related to surface elevations, pile tips, and cut-offs, and ground-water levels.

The special follower was produced after many tests by Mr. Hunicke and his associates, Lt. Col. B. W. Hutson of the Alabama Power Co. It is built to

fit each size of commercial hammer and leads. A piece bolted to its under side is changeable to fit over any type of pile: round, square, H-section, etc.

The Penetrometer is not for sale. Contractors and others are to be licensed to use it. A monthly rental plus a fixed cost per pile is the basis. A feature of the license is that the user agrees to keep a copy of all records made, give another copy to the owner or engineer, and send the originals to Mr. Hunicke to be placed in a library of piling information open to those interested in piling problems.

Further information may be secured from Mr. Hunicke. Or use the Request Card at page 16. Circle No. 31.

Data on 2-Yard Excavator

A 24-page catalog describing completely the Model 855-B 2-yard convertible excavator has recently been prepared by the Excavator Division of the Harnischfeger Corp., 4400 W. National Ave., Milwaukee 14, Wis. The catalog points out the construction features of the Model 855-B, which is convertible to shovel, dragline, bucket, crane, and pile-driving applications. Photographs show the machine, its parts, and its operation.

This literature may be obtained from the company by requesting Bulletin X20-2. Or use the Request Card at page 16. Circle No. 8.

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Aerial Photogrammetry Speeds Map-Making Work

Neither private industry nor government agencies need to be sold on the efficiency and speed with which surveys may be made by aerial photogrammetric methods. But with the thought that many people in both groups would be interested in details of the applications and methods of photogrammetry, Jack Ammann, Photogrammetric Engineers, 829-31 N. St. Mary's St., San Antonio 2, Texas, has published a brochure titled "Air Speeds to Your Map Needs".

This 32-page booklet shows the main operations of photogrammetry, intro-

ducing the various types of maps and explaining the care and engineering precision that go into their making. Fully illustrated, the brochure details the experience of the personnel and the extensive plant and field equipment of the Ammann organization.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 65.

Vibration-Control Materials

Characteristics of the various types of vibration isolation media—springs, rubber, and cork materials, alone or in combination—are given in a new bulletin, G-102, released by The Korfund

Co., Inc., 4823 32nd Place, Long Island City 1, N. Y. Some 50 typical machine and equipment applications are tabulated with recommendations for proper types of vibro-isolators for high efficiency; alternates are suggested for less exacting requirements.

Various types of standard mountings are described with data on loading ranges which run from 10 pounds for small isolators to 50,000 pounds per isolator for a heavy-duty spring type. Applications include compressors, generators, hammermills, crushers, pumps, etc.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 7.

Curb and Gutter Paver

A bulletin describing the Dotmar paver for laying integral gutter, curb, and sidewalks, or sidewalks alone up to 78 inches wide, has recently been released by Dotmar Industries, Inc., 503 Hanselman St., Kalamazoo, Mich. On-the-job photographs show the applications of the various types of machines available. The different screeds and trowels are described and complete specifications for each model are given. Cross-section diagrams illustrate the sections that can be obtained.

This literature may be obtained from the company, or use the Request Card at page 16. Circle No. 1.

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Power and Irrigation Project in Australia

Giant Project Now Under Way Will Include 7 Dams, 16 Power Stations (13 Located Underground), As Well As 84 Miles of Tunnel

By NORMAN BARTLETT

DEEP among the snow-capped ridges of Australia's highest mountains, the advance guard of an army of some 10,000 workers is busy on the southern continent's biggest power project. This is the Federal Government's £200,000,000 Snowy Mountains hydroelectric and irrigation scheme. It will have an installed plant capacity of at least 2,620,000 kilowatts, impound 400,000 acre-feet of irrigation water, and provide power for key defense research projects in an easily defended area. The project will take at least 25 years to complete.

Four towns, seven major dams, sixteen power stations, 84 miles of tunnel, and 490 miles of racelines will be built. Thirteen of the power stations will be underground, one of them at a depth of 4,000 feet, safe from aerial or atom-bomb attack. The work will drown the best part of two townships and should transform the southeastern corner of the world's biggest island continent within a couple of decades.

In charge is a 53-year-old New Zealand engineer, William Hudson, B. S. Engg., Member of Institute of Civil Engineers, Commissioner of the Snowy Mountains Hydroelectric Authority. Commissioner Hudson, who has already built ten dams in Australia, New Zealand, and Scotland, will set up headquarters at Cooma, about 30 miles from his first dam site. A Melbourne town planner is blueprinting this working "capitol", which will house about 1,000 administrative staff, including 200 engineers and about 100 draftsmen. At the same time the Snowy Mountains Authority will build three other working towns, one high in the mountains at Jindabyne, site of one of the biggest dams; another in the valley of the Tumut, about 50 miles away across the mountains; and a third on the Upper Murray in Victoria.

Will Use Snow

The Snowy Mountains Hydroelectric Authority will tap Australia's vast practically unused snow reservoir in the Australian Alps, a tangle of rugged mountains between Victoria and New South Wales. Among these flat-topped mountains more than 1,250,000 acres lie under snow for six months each year. This reservoir already feeds irrigation schemes along Australia's two most important rivers, the Murray and the Murrumbidgee, but every year millions of gallons spill down the mountain sides in untapped rivers to waste uselessly in the sea. Biggest of these previously untapped streams is the Snowy River and its tributaries. The Snowy Mountains Hydroelectric Authority will harness this waste water to boost Australia's power and irrigation potential.

To achieve this, the snow-fed waters of the comparatively short, swift mountain streams, particularly the Eucumbene and the Snowy, will be diverted into the long comparatively slow-moving Murray and Murrumbidgee, which water large areas of Victoria and New South Wales. In the confined and tunnelled drop from the mountain dams to the rivers of the plain, the rushing water will generate electricity equal to the total output of all steam power stations in Australia today. After driving the power stations, the water will be used for irrigation.

To Be Built in Stages

The first major stage in the Snowy

Mountains project includes four major dams, about 45 miles of tunnel, and 160 miles of racelines, and will drive seven power stations with a total installed capacity of over 1,000,000 kilowatts. The water diverted from the Eucumbene, the Tooma, and the Upper Murrumbidgee will pass down the Tumut Valley into the Lower Murrumbidgee and add approximately 1,200,000 acre-feet of irrigation water each year to the farming areas of New South Wales. Engineers have planned the levels in the tunnels so that surplus water from the Upper Tumut and the Upper Tooma, if needed, can be turned back into the Adaminaby Dam for storage and later use.

The second stage of the completed scheme will divert the Snowy River into the Murray through a tunnel about 25 miles long and 30 to 40 feet in diameter. The tunnel will pass almost under Mt. Kosciusko (7,328 feet), Australia's highest mountain, and will run on a slight westerly incline at a depth of

(Concluded on next page)

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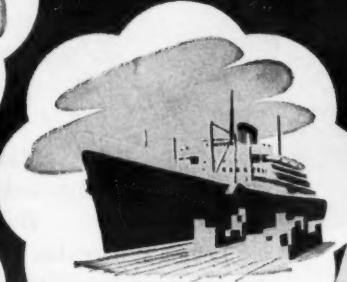
PETROLEUM



MANUFACTURING



CONSTRUCTION



MARINE

nearly 4,000 feet. The Snowy waters will be gathered in a dam at Jindabyne and flow into the Swampy Plains River, a tributary of the Murray. There will be several deep power stations along the 25-mile tunnel, two of them driven by water shafts from riverbeds in the mountains above. One shaft will be 1,000 feet deep and the other 100 feet.

Taken together, the Eucumbene-Tumut-Murrumbidgee scheme centered on the Adaminaby Dam, and the Snowy-Murray scheme centered on the Jindabyne Dam, will have a capacity of 2,620,000 kilowatts of power and provide 1,700,000 acre-feet of irrigation water a year. The total scheme includes seven major dams, storing at least 4,000,000 acre-feet, 16 power stations (13 of them underground), 84 miles of tunnels, and 490 miles of race-lines. The capital cost is estimated at £125,000,000, excluding transmission. Transmission costs will amount to anything up to another £100,000,000, depending on the distances covered.

Building for Future

What will this ambitious project mean to Australia? "The two objectives of the Snowy Mountains Authority are water and power", said Mr. Hudson in a recent interview. "Water to bring more land into production and to produce power, power to increase our industrial development. More power in an expanding country like Australia is an urgent national need. We must have more power for defense, which depends on power, and for the growing needs of a growing community. Cheap power should mean the decentralization of industry. Harnessed water, which formerly went to waste, will mean more land and more food for more people."

Experts estimate that the completed scheme will irrigate an additional 3,500,000 acres in the Murrumbidgee and Murray Valleys. Snowy Mountains hydroelectric power will link up with the Sydney and Melbourne power centers and become the center of an electric grid system covering all southeastern Australia.

A 5½-Yard Capacity Convertible Shovel

A new 5½-yard convertible excavator, the Model 4500, has been announced by Manitowoc Engineering Works, Manitowoc, Wis. Designed for mobility, this machine has air controls for all operating clutches and brakes, straight diesel power, and crawler drive. Ease of movement from job to job is a special feature, possible because major dismantling is not required, the company says. Loading or unloading from trailer or flatcar can be done with the machine handling its own heavy components.

Standard crawlers are 25 feet 9 inches long and 21 feet wide, with choice of 48 or 60-inch pads. Steering is air-controlled. Jaw-type clutches permit positive locking of either crawler for short-radius turns in either direction.

Shovel booms are available in lengths of 38 feet 6 inches with 27-foot stick and 5½-yard dipper; 50 feet with 37-foot stick and 5-yard dipper; or 60 feet with 45-foot stick and 4½-yard dipper. The dipper stick is a single tubular unit



The new Manitowoc Model 4500 standard shovel has a 38 1/4-foot boom, 27-foot stick, and 5 1/2-yard dipper. Ease of movement from job to job is a special feature.

which rolls through the saddle on concave rollers. The crowd and retract mechanism is the independent cable type. Double lines are driven from a drum mounted on the boom, and have

no reverse bends.

Optional dragline and clamshell boom lengths vary from 100 to 140 feet, with the upper 75 to 95 feet made of aluminum alloy. All-steel lift-crane booms

are available in lengths from 87 feet up, with a crane rated lifting capacity of 100 tons at a 20-foot radius.

Other features include choice of diesel power plant with option of hydraulic torque converter; all gears except the circle gear splined to shafts and enclosed, running in an oil bath; 40-inch shoe-type swing clutches with each shoe individually applied by air pressure; and replacement of clutch and brake blocks without removing bands.

Further information on this new excavator may be secured from the company by requesting Bulletin No. 45-50. Or use the Request Card at page 16. Circle No. 81.

New Keystone Representative

William D. Redhead is now covering eastern Tennessee, North Carolina, South Carolina, Alabama, Georgia, and Florida for Keystone Asphalt Products Co., Division of American-Marietta Co., Chicago, Ill. His headquarters are in Atlanta, Ga.

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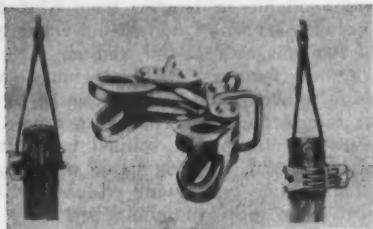
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A series of heavy knife edges on the inner surface of the new Downs pile puller is designed to grip any size or shape of wood pile or pole.

Heavy Knife Edges On New Pile Puller

A new pile puller for extracting wood pilings, poles, and posts has been announced by the Downs Crane & Hoist Co., 540 West Vernon Ave., Los Angeles, Calif. Designed to adjust itself to any size or shape of piling, the new puller has an inner surface consisting of a series of heavy knife edges. These bite into the pile transversely to the grain of the wood, providing a positive hold for pulling pilings that are hard to grip due to creosote coating, marine growth, grease, or odd shape.

The pile puller maintains its grip throughout the pulling and stacking operation, yet is easy to remove from the pile, Downs says. It can be set in place on a pile by hand or with the assistance of a pile line. The large handles aid workmen in setting the pile puller. Smooth eyes are designed to be easy on wire rope slings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 9.

Muckers for Tunneling

A new 18-page catalog describing the Conway shovel and other accessory mucking equipment for tunnel operations has recently been released by the Goodman Mfg. Co., Halsted St. at 48th, Chicago 9, Ill. Presented in the booklet are the new Type 100, the improved Type 75, the Type 50 B, and the 120 Series Conway shovels. Complete dimensions, specifications, and construction features are given for each machine.

The literature points out that there are just four loading motions for the Conway, all powered from one motor—trammimg, rooting with the dipper, swinging the boom, and hoisting the boom and dipper. These motions may be

combined or operated independently of each other. A two-page general description of the Conway indicates all of its construction and operational features. The booklet also lists representative Conway installations, indicating the name of the tunnel, its location, length, and finished dimensions.

The catalog explains that the Goodman Mfg. Co. also builds a complete line of tunnel locomotives—trolley, trolley and reel, battery, and combination trolley and battery locomotives, including the Mancha line of storage-battery locomotives. This line is particularly adapted for use with Conway shovels, the booklet says.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 130.

A Centrifugal Pump Rated at 15,000 GPH

A new lightweight self-priming portable pump has been announced by McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif. Rated at 15,000 output, it is made of cast aluminum and has a center-balanced handle for easy handling.

The 5-hp gasoline engine has a kick-proof automatic-rewind starter, a rain-proof ignition system, and an automatic governor which controls its speed at all loads. Engine controls are conveniently grouped in one panel. A non-clogging impeller, designed for a 28-foot suction lift, is mounted directly on the engine shaft. There are no special fittings to service, as the entire unit is lubricated by oil added to the fuel. For periods of long operation, a three-way fuel valve permits the use of a separate fuel tank. The pump and engine are mounted on a spring base for sound footing on all types of ground.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 122.

Burch Sales Corp. Formed

The Burch Sales Corp. was formed recently to handle sales and promotion of all equipment including dump bodies and hoists built by The Burch Corp., Crestline, Ohio. R. S. Jenkins is President of the sales corporation, A. F. Brooker is Treasurer, and J. L. Morrow, President of The Burch Corp., is Vice President.



MECO Surface Seal Protects Blacktop Pavements!

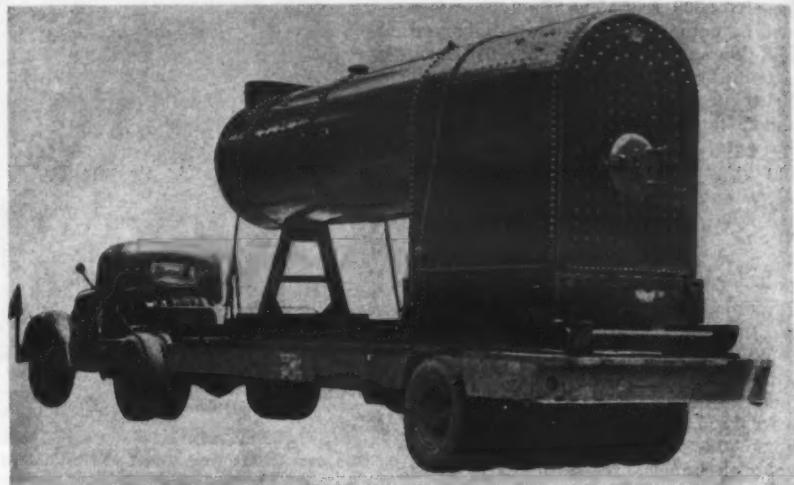
You can make better blacktop installations with MECO Surface-Seal. Contractors know that MECO seals, renews and tightens the surface, as well as beautifying the pavement. It is particularly useful on areas which take a lot of punishment. Gas stations, parking lots, airports and private

driveways use it because it is weather and solvent proof.

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The 104-hp Lucey boiler provides working pressures up to 150 psi for various steam power services. It is skid-mounted for transportability.

Steam Power Service With 104-Hp Boiler

A 104-hp portable boiler, designed for working pressures up to 150 psi, is manufactured by The Lucey Boiler & Mfg. Co., Chattanooga, Tenn. Built to ASME Code and designed for a wide variety of steam power services, the Lucey 104 features a 1,040-square-foot heating surface, a 160-cubic-foot furnace volume, a steam volume of 54 cubic feet, an oversized seamless firebox, and calked and seal welded butt struts.

The boiler is adaptable for oil, gas, or stoker firing and may be skid-mounted for portability. The complete boiler weighs 18,000 pounds. Overall dimensions are 22 feet 6 inches x 62 inches x 7 feet 6 inches. Standard equipment includes: steam gage,

syphon, cock, and inspectors' test connections; one or two ASME safety valves set to meet individual pressure requirements; water-gage glass; blow-off valve; globe and check valve for feed; and the necessary handhole and manhole plates complete with gaskets. The 30-inch-diameter stack, 28 feet long, is made of 12-gage steel. Additional sections are optional.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 157.

McGraw Chairman Resigns

Frank H. McGraw, a prominent figure in the construction field for more than 50 years, has resigned as Chairman of the Board of F. H. McGraw & Co., industrial construction firm of New York City.

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Steel-Pile Bridges Built in Mississippi

Truck-Mixers Haul Concrete to Each Structure From Central Batch Plant; on New Location

ONE of the largest single highway projects current in Mississippi is a 3-bridge contract on State Route 26 between Lucedale and Wiggins in George County in the southeastern corner of the state. The three bridges have a total length of 6,283 feet, or 1.2 miles, and are connected by a roadway which was graded in 1948. While the gross length of the project is 4.9 miles, the previous grading contract extended the roadway to within a few miles of Lucedale on the east and Wiggins on the west. The two towns are 31 miles apart.

Since the spring hurricane of 1947 when U. S. 90, the Gulf Coast Highway, took such a battering that it was closed to traffic for several days, Mississippi State Highway Department engineers visioned a parallel route as a strict necessity. U. S. 90 is the old Spanish Trail that sweeps around the Gulf of Mexico from Florida to Louisiana. From Mobile, Ala., to New Orleans there is no alternate paralleling route available. The section through Alabama has a narrow rough-riding pavement with bad shoulders, but it lies inland and was not damaged by the 1947 hurricane. Through Mississippi, U. S. 90 is a fine dual highway for long stretches. But it runs close to the water, and during the hurricane, the stepped sea wall could not restrain the waves from pounding across the pavement. At the time, the economy of the Gulf Coast area was seriously affected with this single major artery of transportation closed for repairs.

Accordingly the Mississippi Highway Department began the development of a parallel route further inland as an alternate to U. S. 90. A good paved road now runs northwest out of Mobile toward Hattiesburg, Miss. At Lucedale, Miss., on this route, State 26, a gravel road, cuts off westerly to connect with Wiggins on U. S. 49. It is this State Route 26 that has been relocated on a new solid roadbed. Paving will wait for the completion of the three bridges that are now under contract. Subsequent road work will no doubt close the gaps in the new location at the Lucedale and Wiggins ends. There is also the possibility that the new location may be pushed still further westward 32 miles to Poplarville, Miss., on U. S. 11. If that is done, traffic between Mobile and New Orleans, a heavily traveled highway, would have an alternate route that would skip the congested Mississippi Gulf Coast towns and cities altogether.

Bridge Contract

The bridges on this Federal-Aid project are being built by the Scott Construction Co. of Thomasville, Ga., under a \$1,227,097.42 contract to the Mississippi State Highway Department. Site clearing got under way in March, 1948; the first test pile was driven in July; and the following month work got started on the pile bents and piers. Delays in the delivery of steel tied up the work, as did high water, especially during the winter and early spring. The first year the progress was slowed down from November 24, 1948, through April 16, 1949, when the low coastal area was flooded. However, the contract is scheduled for completion this spring.

The largest of the three bridges, A, is 5,533 feet long, and spans the Pascagoula River at the western end of the project. Easterly, over a mile, is the 510-foot relief bridge B. Then comes another gap, about 2.7 miles, before

reaching bridge C, a 240-foot structure over Big Creek. The large bridge replaces a ferry on the old state road location about 5 miles to the south.

From west to east bridge A is composed of 22 spans at 30 feet, 1 at 60 feet, 1 at 550 feet, 1 at 60 feet, and 140 spans at 30 feet. The long 550-foot span is a continuous truss, while the others are all WF steel beam spans. Bridge B consists of 17 WF spans at 30 feet. Bridge C has WF spans throughout, with 3 at 30 feet, 1 at 60 feet, and 3 at 30 feet to form a symmetrical structure.

Concrete River Piers

The river bridge A contains four reinforced-concrete piers, numbered I, II, III, and IV from west to east, supporting

(Continued on next page)



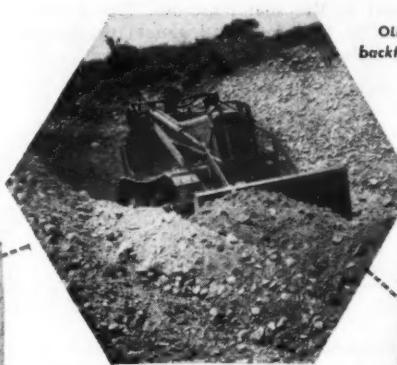
C. & E. M. Photo

During a pile-cap pour on the Pascagoula River bridge, a Northwest No. 20 crane lifts a Blaw-Knox 1-yard concrete bucket to the forms from a Jaeger 2-yard truck-mixer mounted on an International truck.

OLIVER HG Crawler Tractor with Ware backfiller blade attached to shovel arms.



OLIVER HG Crawler Tractor with Ware backfiller blade attached to shovel arms.



OLIVER Model "88" Wheel Tractor with Ware Boom handling cast iron pipe.



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These powerful tractors and the hydraulically operated loaders are easy to operate . . . easy on maintenance and operating costs. Lift and bucket are hydraulically controlled. Hydraulic control of bucket assures greater breaking-out action and full loads . . . prevents wasteful spillage.

"Midsection" pivot allows longer reach of dumping position and distributes the weight advantageously over the tractor frame to minimize strain. The hydraulic rams are designed to take most of the shock loads, assuring longer life for both tractor and loader.

And, the tractor-loader unit can be quickly converted to backfiller, boom or lifting fork. Special buckets are available for coal, snow or humus loading. The hydraulic system can be used to power other equipment such as mowers, sweepers, etc., in combination with the loader. For all the facts, see your local Oliver Industrial Distributor, or write direct to:

OLIVER HG Crawler Tractor with Ware Loader on ditching job.



OLIVER Model "88" Wheel Tractor and Ware Loader loading out gravel.



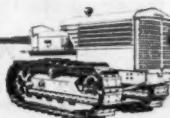
OLIVER HG Crawler Tractor with Ware Loader on ditching job.



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Steel-Pile Bridges Built in Mississippi

(Continued from preceding page)

porting the two spans at 60 feet and the single 550-foot span. Steel foundation piles support the river piers. The bottoms of the main piers II and III are down to elevation minus 11.85, while piers I and IV go down to minus 6.0. Mean low water in the Pascagoula River is at elevation 21.0, and a high water reading of 48.9 has been recorded.

Piers II and III are made up of two 18 x 15-foot footings which are 6 feet deep with a 6-foot seal beneath that. The steel foundation piles go through the seal and project 2 feet into the footing. From bottom of seal to top of cap the piers are 68 feet high, and the two shafts are connected by a web wall, 1 foot 9 inches thick, which extends down 28 feet from the bottom of the cap, which is 4 feet deep x 6 feet wide. Piers I and IV at 64 feet are not quite as tall. They have a 4-foot seal beneath a 6-foot footing. The shafts for both piers are round and are 3 feet 8 inches in diameter at the top and are battered $\frac{1}{2}$ inch per foot.

The continuous trusses for the 550-foot span are on 32-foot 4-inch centers and range in height from 25 to 44 feet. From the pavement to the cross bracing there is a 15-foot vertical clearance. Steel for this span is furnished and erected under a subcontract to the Nashville Bridge Co. of Nashville, Tenn. The design bridge loading is H15-S12-44.

Built in Sheet-Pile Cofferdams

In constructing the river piers, the contractor built timber trestles out from the shore. Piers III and IV were built first, working from the east-bank trestle, followed by I and II from the west shore of the river. The piers were built within steel sheet-pile cofferdams constructed with Bethlehem M116 sections, 50 feet in length. A Lima 1001 crane with an 85-foot boom was set up on the work trestle for the pier construction. The sheeting was driven by a drop hammer, and pulled later for re-use by a Vulcan 400-A pile extractor. As many as 9 horizontal sets of 12 x 12 rangers were used in bracing the cofferdams.

The steel H-piling used throughout the job was 10-inch 42-pound sections supplied by the Tennessee Coal & Iron Co. It was shipped either from Chicago or from a Pennsylvania plant by rail to a siding of the Gulf, Mobile & Ohio Railroad at Merrill, 10 miles to the north, and hauled to the job site by trucks. The piles were driven from swinging leads on the crane by a McKiernan Terry 9B2 hammer powered by a coal-burning vertical boiler.

Excavation was handled with a clamshell, and the seal concrete was placed with an underwater bucket. For unwatering the piers a complement of Jaeger pumps were on hand including one 6-inch, three 4-inch, one 3-inch, and two 2-inch units. Footing forms were built of wood, while steel forms were used for the piers. The steel forms, originally made by the Vincennes Steel Co. of Vincennes, Ind., were secured from the Moon Construction Co. of Port Gibson, Miss., and altered for this job at the Ingalls Shipyard in Pascagoula, Miss. Reinforcing steel came from the Connors Steel Co. in Birmingham, Ala., delivery to the project being made by truck.

Concrete Plant

A concrete batch plant was set up on the roadway embankment fill at the east end of the main bridge. A Heltzel 20-yard 2-compartment bin held the sand and gravel aggregate that was supplied by the American Sand & Gravel Co. of Hattiesburg, Miss. The material was shipped in hopper-bottom

cars to the siding at Merrill, where it was unloaded by a Burch conveyor into three dump trucks and hauled to the plant. It was stockpiled along the side of the roadway and fed to the storage bin by a 20 Northwest crane with a 35-foot boom and a $\frac{1}{2}$ -yard clamshell bucket.

Lone Star bag cement was shipped from the mill at Spocari, Ala., to the job siding, and hauled from there to the plant by truck. It was kept in a wooden shed. At the plant was a 1,000-gallon water tank that was filled from a well. Concrete was mixed in a couple of Jaeger 2-yard transit-mixers mounted on International trucks which delivered the material directly to the structure being poured. Materials were mixed at least a minute and never more than 30 minutes in the truck-mixers.

A 12-bag batch was used, to which water was added at the rate of 5.4 gallons to the bag. The dry weights of a typical batch were as follows:

Cement	1,128 lbs.
Sand	2,359 lbs.
Gravel	3,990 lbs.

A richer mix than the above was used in the seal concrete. The gradation of the sand and gravel used was as follows:

Sieve Size	Per Cent Retained	Gravel	Sand
2-inch	0	...	...
1 1/2-inch	0.5	...	...
1-inch	0.20	...	...
5/8-inch	10.45	...	...
3/4-inch	40.70	...	...
5/8-inch	0	...	...
No. 4	94.100	0.5	...
No. 6	99	10.50	...
No. 10	...	30.70	...
No. 16	...	70.97	...
No. 20	...	95.100	...

Trestle Bents

Outside of these four piers, the remainder of the bridge construction consists of trestle bents, mostly on 30-foot spans as previously noted. The bents are made up of four 10-inch 42-pound steel H-piles driven on 7-foot 8-inch centers. The two inner piles are plumb, while the two outside piles are battered $\frac{1}{2}$ inches to the foot. At the two 60-foot spans there is a double bent of piles with the rows $2\frac{1}{2}$ feet apart on centers. All the trestle piling was driven by the W. R. Fairchild Co. of Hattiesburg, Miss., with a portable skid rig on which was mounted a Vulcan 50C steam hammer. The rig moved over the ground except in a few low spots where falsework was erected to keep it out of the water.

The piles came in 54-foot lengths, but as the lengths required varied from 65 to 90 feet, additional sections were cut off and spliced to the piece that was initially driven. Three Hobart electric welding machines were available for splicing and for welding to the piles the angle irons used in cross bracing the bents. Piling was driven through clay and sand to seat on a stratum of blue marl. Penetration averaged from 45 to 55 feet, and the piles developed a bearing capacity of 40 to 60 tons.

The tops of the piles project 1 foot into poured-in-place concrete caps

(Continued on next page)



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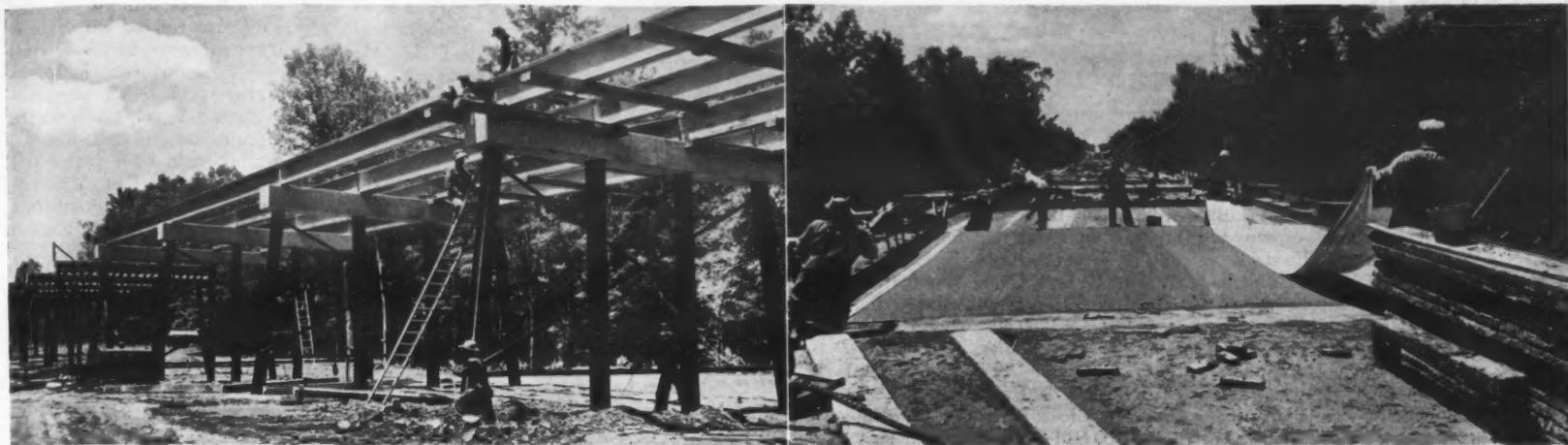
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C. & E. M. Photos

that are 2 feet square for the 30-foot majority spans, and 2 feet deep \times 4½ feet wide for the double bents at the 60-foot spans. Both types of caps are 26 feet long. To support the cap forms, 5 x 12's were bolted along each side of the bent near the top of the piles. Across these 2 x 6's were laid, narrow end up, on 18-inch centers and with wedges beneath them for adjusting to exact grade. Bottom and side cap forms were constructed of 2-inch lumber lined with Masonite. Along the sides the forms were backed with 2 x 6 vertical studs on 15-inch centers, and across the open top were other 2 x 6 ties.

Crane and Bucket Pours

At the batch plant the truck-mixers backed under the aggregate bin for the sand and gravel, then picked up the cement and water in quick succession, and drove to the bent on which the cap was being poured. A haul road was maintained over the flat lands alongside the trestle bents with an International TD-6 tractor-dozer and an Adams motor grader. A Bailey bridge carried traffic over Big Creek while the new span was under construction at that point. At the bent the concrete was discharged into a Blaw-Knox 1-yard concrete bucket which was lifted to the forms by a Northwest 20 crane with a 35-foot boom. For vibrating the concrete as it was placed, the contractor used Master and Mall vibrators. Water was used in curing.

The caps supported four steel stringers to each span, spotted on 7-foot 8-inch centers. On the 30-foot spans the two inside stringers are 24-inch WF 84-pound sections, and the two outer ones are 24-inch 76-pound beams. For the 60-foot spans, 36-inch WF beams are used, 194-pound sections on the inside and 182-pound sections on the outside. The structural steel was furnished by the Bethlehem Steel Co. of Bethlehem, Pa., from which point it was shipped by rail to Merrill, and then trucked to the job where it was erected by crane.

Supported by the steel is a 7½-inch reinforced-concrete deck slab with a 26-foot clear roadway. On each side is a 2-foot 4½-inch curb walk protected by a concrete post rail. The deck forms were built of 1-inch lumber, while the walk forms, cantilevered out to the sides, were 2-inch stock lined with Masonite to give a smooth appearance to the outside surface. In supporting the overhanging forms, five 6 x 8 needle

beams on 7-foot centers were secured crossways to the two stringers on each side of a 30-foot span. They in turn held up 8 x 8 runners, laid out longitudinally to the bridge, on which the curb forms were built.

The workmen in the left-hand photo are welding angle-iron cross bracing to steel H-pile bents of the main bridge on Mississippi State Route 26. At the left is a Hobart welder. Above, concrete in the deck slab is being belted and covered with burlap.

Deck Slab
In forming the deck, carpenters cut 2 x 2 legs which were set vertically on 15-inch centers along the lower flanges of the stringers. Across these were

(Concluded on next page)

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Steel-Pile Bridges Built in Mississippi

(Continued from preceding page)

stretched 2 x 8 jacks on which the 1-inch deck lumber was laid. At the ends of each span a steel header was placed, and later removed, thus leaving an expansion joint. The header was built with a 1 1/4-inch parabolic crown to conform with the crown of the deck.

For the deck pours a No. 4 Northwest crane with a 50-foot boom was generally employed to handle the concrete bucket filled at ground level by the truck-mixers. A 2-yard floor hopper, set up on the bridge, was filled with concrete which was then discharged into rubber-tired buggies. They were wheeled out on runways and dumped into the forms.

The concrete was leveled off with a 34-foot-long screed made from a timber truss with a steel shoe at the bottom and plow handles at the ends. After the screeding, the surface of the concrete was belted smooth with a 6-inch-wide strip of canvas, and then covered with burlap. The latter was kept wet until the concrete had attained its set. Then the burlap was removed and replaced with a layer of sand that was also kept wet until the concrete was fully cured.

Piling Encased

At Big Creek bridge the steel piles are completely encased in concrete for their entire length. Piles in the two other bridges are encased for a distance of 3 feet below ground level, and 2 1/2 feet above. The encasement is 1 foot 2 inches square, reinforced with 6 x 6, 10/10 welded wire fabric.

The bridges have open-end abutments featured by flared wings and concrete slope paving 5 inches thick. For this work the concrete was mixed in Jaeger 2-bag or 3-bag mixers which also served as stand-bys during the larger bridge pours.

Other incidental equipment used on the project included a 60 x 20-foot steel barge for moving materials, men, and machines across the Pascagoula River during the pier construction. Steel was moved about the job on a Chevrolet truck on which was mounted a Gar Wood winch.

Quantities and Personnel

The major items in the contract were broken down as follows:

Items	Bridge A 5,533 ft.	Bridge B 510 ft.	Bridge C 240 ft.
Class B concrete	5,405 cu. yds.	544 cu. yds.	294 cu. yds.
Class C concrete	1,167 cu. yds.	...	...
Class S concrete seal	370 cu. yds.	...	...
Reinf. steel	896,400 lbs.	79,180 lbs.	38,410 lbs.
Struct. steel	1,839,600 lbs.	170,580 lbs.	110,640 lbs.
Steel superstructure	510 tons	3,820 lin. ft.	1,850 lin. ft.
Steel piles	48,700 lin. ft.	...	...
Excavation	2,330 cu. yds.	...	...

The Scott Construction Co. of Thomasville, Ga., employed an average force of 95 to 100 men when the project was at peak construction, under the direction of Erwin J. Black, Superintendent. Charlie Wall is Office Manager.

For the Mississippi State Highway Department, R. I. Newcomer is Project Engineer and George L. Lemon, District Engineer. The Department is headed by R. A. Harris, Chief Engineer. E. B. Cavallo is Construction Engineer, and C. S. Hill is Bridge Engineer.

Automatic Backstop

A simplified automatic backstop designed to prevent the "backing up" or "running away" of inclined conveyors, bucket elevators, and similar equipment has recently been produced by The American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa. It is a ready-made device for immediate installation.

The backstop is a ratchet-type device which operates automatically when power interruption, overload cutout, or failure of a prime mover occurs. It can be mounted in any position on the head shafts of conveyors or elevators. As long as the shaft is turning in the proper direction, the pawl is entirely disengaged from the ratchet. Immediately upon reversal, the pawl automatically engages the ratchet, locks the shaft in place and holds it there until forward power is again applied, at which time the pawl pulls out of the ratchet teeth. The company states that the entire operation is smooth and positive, with no shock transmitted to the driven machine.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 115.

Salesman for Templeton

Arthur Templeton is now a member of the sales engineering staff of Templeton, Kenly & Co., Chicago manufacturer of Simplex mechanical and hydraulic jacks. He will cover the Chicago territory. Prior to his promotion, Mr. Templeton, a son of the company's founder, was connected with the Production Department.

Reinforcing Rod, Deformed

A new 8-page bulletin describing a specialized steel service for contractors has been released by Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill. It features the Hi-Bond reinforcing bar, designed to give greater bond between steel and concrete. Other features of Hi-Bond listed in the folder are as follows: it is easy to tie, it stays in place during pouring operations, hook anchorage is unnecessary, and cracking of concrete structures is reduced.

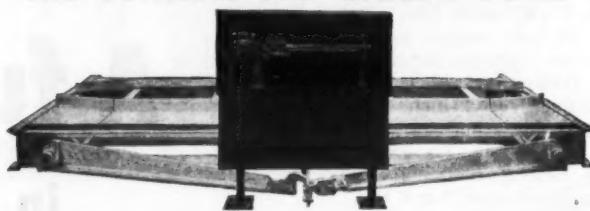
Other products mentioned in the catalog are electric-welded wire fabric, steel forms for concrete-joist construction, steel spirals for concrete reinforcement, expanded metal, reinforcing accessories, caisson rings, structural, safety steel plate, hot and cold-finished carbon and alloy-steel bars, plates and sheets, and stainless steel in all forms.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 152.

Allis-Chalmers Appointment

R. S. Stevenson recently became General Sales Manager of the Allis-Chalmers Tractor Division, Milwaukee, Wis. He has been with the company since 1933 and Assistant General Sales Manager of the Tractor Division since 1948.

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The kids have moved in on earth-moving, too. New London Metal Processing Corp. makes this toy model of the Caterpillar D4 tractor. It crawls and dozes when Junior pedals.

A New Tractor Toy Breaks 'Em in Young

Youngsters can now get an early start in the earth-moving industry, moving sand or soft earth in the yard or bulldozing snow from sidewalks and drive with a new tractor toy.

A junior model of the Caterpillar diesel D4 track-type tractor that crawls along on its own tracks and has an operating bulldozer blade has recently been introduced to the toy market by The New London Metal Processing Corp., New London, Conn. Tailored to appeal to the child of 3 to 9 years, the toy is educational as well as entertaining.

Designed along the principles of kids' pedal cars, the tractor has tracks which are grooved to roll over the four rubber-tired wheels driven by a sprocket and chain drive from the pedals. There are two steering clutch levers, just as on the real machine, and each lever lifts the track on the same side off the ground allowing the other track to pull the toy around in a turn. Another lever on the right side raises and lowers the bulldozer through a cable arrangement.

The company has been granted a license by Caterpillar Tractor Co. to use the regulation Caterpillar trademark. The tractor will be available soon in toy departments and shops, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 142.

A Hydraulic Jack For Rock Breaking

For use where explosives or ball drop is prohibited or impractical, the K. O. Duncan Co., 1350 Wright St., Los Angeles 15, Calif., has developed the hydraulic Roc-Jak, a rock-shearing device.

In operating the Roc-Jak, one or more holes 3½ inches in diameter and 2 feet in depth are drilled into the material to be broken. The breaker

body is inserted in the hole, together with an equalizing shim or feather. The hand-operated oil pump is connected to the Roc-Jak and pressure applied. After the "slack" in the hole has been taken up, an additional piston travel of ½ inch is sufficient to cause the break, Duncan says.

Oil pressure forces the ten pistons outward from the Roc-Jak body against the wall of the hole, and within 2 minutes of operating time, the company says, a pressure of over 150 tons is developed in the hole and causes a clean shearing break at right angles to the point of thrust. For demolition jobs where the material to be broken is 8 feet or more wide and 8 feet thick, the company advises the use of two or more Roc-Jaks in unison, with the holes spaced in such a way as to equalize the burden.

The breaker body itself is 24 inches in length and 3 inches in diameter. It is constructed of tough steel, heat-treated and precision-ground, and has ten machined piston openings. The ten



Foley Bros., Inc., used six Roc-Jaks in this 3,000-cubic-yard concrete removal job. Oil pressure forces the ten pistons of the breaking jack against the wall of the hole to cause a clean shearing break.

1½-inch alloyed-steel pistons fitted with Neoprene cups are tested to withstand 15,000-psi bearing against a 30-inch steel equalizing shim or feather. Included with the unit is a 15,000-psi

capacity hydraulic pump with a 6-foot length of high-pressure hose.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 61.

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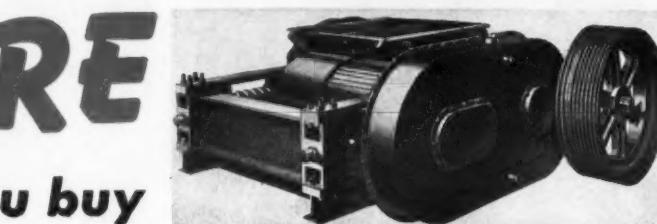
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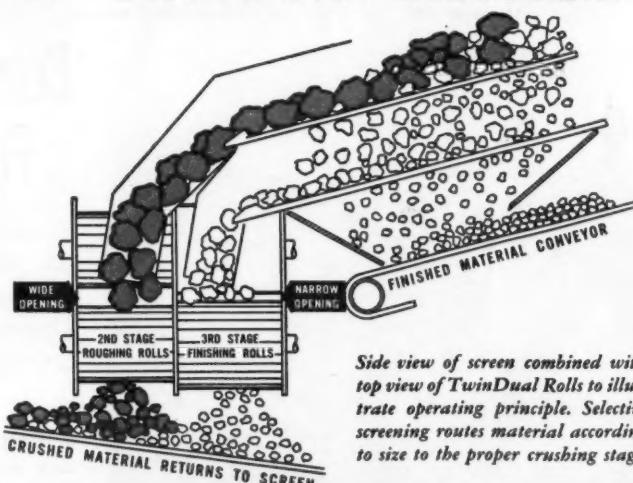
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- 4 30% to 50% of material entering Second Stage is reduced to finished size and does not require reduction by the Third Stage.
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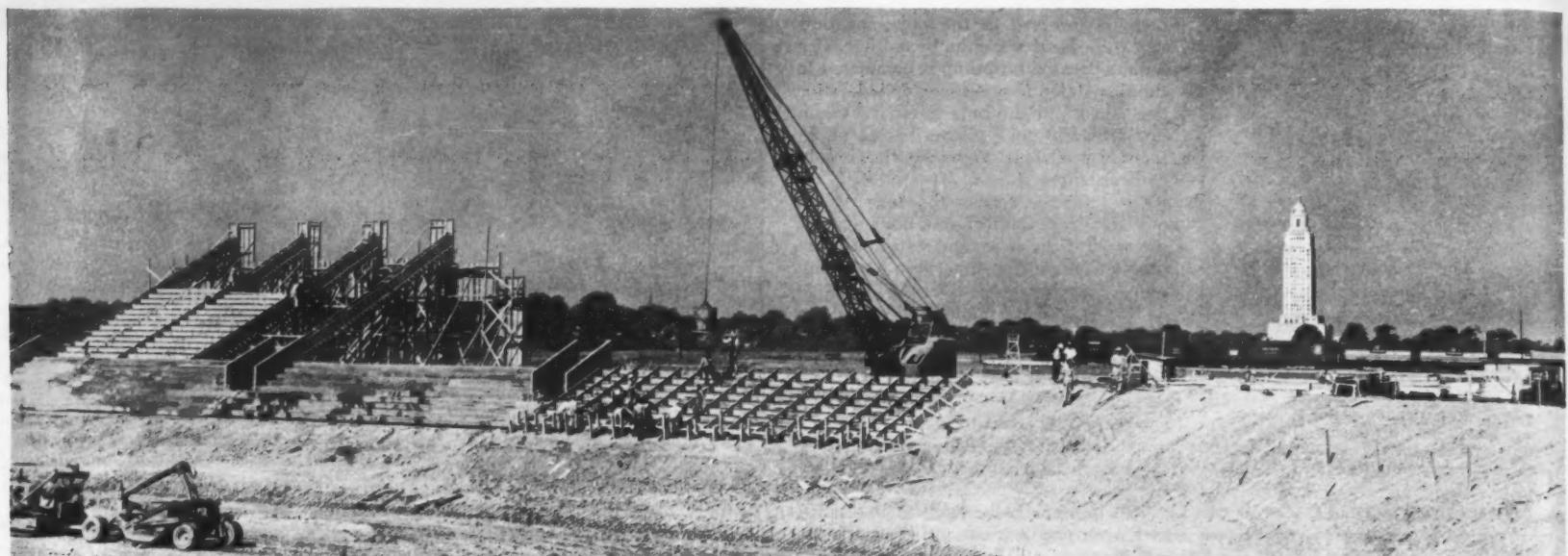
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1. At the north end of Baton Rouge Stadium, a P&H 655 crane lifts a concrete bucket to the pour. That's the state capitol in the background.

C. & E. M. Photos



2. Here's a view of form work from the back of the center section of the stadium, on the west side. The press box now tops this section.



5. Concrete is mixed in a Jaeger 16-S three-bag mixer and discharged into a $\frac{1}{4}$ -yard hopper mounted within a pipe framework on an International truck.



3. Form work from the field side, with Engineer Blakewood at left and Superintendent McClellan standing beside him.



4. A transit lines up metal pan forms for riser and tread pours. Subcontractor L. A. Pinner and Super McClellan look on.

Concrete Stadium For Baton Rouge

Seats 21,000 With 45 Rows
On the Sides and 20 Rows
At the North End; South End
Open; Steel Pan Forms Used

By WILLIAM H. QUIRK,
Eastern Editor

♦ A NEW reinforced-concrete stadium was constructed last year at Baton Rouge, La. Built on a 32-acre site, the structure seats 21,000 persons with 45 rows of seats along the east and west sides, and 20 rows at the north end. The south end was left open for future expansion. The field runs north and south.

The Baton Rouge Municipal Stadium, as it is called, is located on state land east of the capitol. The site was dedicated by the Governor to the Recreation and Park Commission of East Baton Rouge Parish. The structure was financed by a \$500,000 bond issue, and was built by J. P. Ewin, Inc., Engineers and General Contractors, of Mobile, Ala. The main contract totaled around \$366,000. The field is used primarily for football and other athletic events, mostly by the local high school.

The site was well chosen, being only a short distance from the business and civic center of the city. The gently rolling land drains to ditches at the east and south sides of the tract. Over the playing field the grade was lowered approximately 15 feet below ground level by removing some 52,000 yards of material. The excess dirt was put to good use in leveling the auto parking area adjacent to the stadium.

(Continued on next page)



6. From the hopper, the concrete is dumped into a Blaw-Knox $\frac{1}{4}$ -yard bucket set in a hole to bring it below hopper level.



7. Then the P&H 655 crane swings the bucket over the forms. J. P. Ewin, Inc., completed the stadium last fall.

Reinforced-Concrete Structure

Grading got started in March, 1949, and was completed within two months. Concreting got under way before the earth work was finished, and the stadium was completed in time for the football season last fall. Dirt was removed from the field area with six tractor-scrapers—three LeTourneau 6-yard Carryalls pulled by Caterpillar D7's, and three Bucyrus-Erie 8-yard scrapers pulled by a D8, an International TD-14, and an Allis-Chalmers HD-14. Average hauls with the sand-clay material ranged from 600 to 800 feet. Despite the fairly deep cut over a large area, the ground was consistently dry, thus providing a well-drained field.

The concrete stands of the stadium are supported partly by the dirt bowl rimming the excavation, and partly by concrete column and beam construction. The lower 21 rows are founded on the earth fill, while the remaining tiers of the 45 rows along the sides are up in the air. All of the north stands are built along the ground slope. Between the 21st and 22nd rows of the side stands there is a retaining wall, 6 inches thick and averaging 8 feet high, over 300 feet long. Behind that the fill was leveled off for the concrete superstructure.

Spectators enter the stadium at ground level through vomitoria, four to a side, with their grade even with the 15th row. These entrances divide the east and west stands into five sections which are 99 feet wide, measured from row 1 to 45. The 20 rows of the north stand take in a strip 44 feet wide, including a 4-foot walk around the top. The playing field is at least 20 feet from the stands at any point. On top of the west stand is an enclosed press box with space for 56 desks, four booths for radio broadcasts, and a booth for a public-address system. There is also a photographers' gallery—a 13-foot-wide x 110-foot-long platform enclosed by a railing.

Illumination for night contests is provided by four light poles, 110 feet high, on each side of the stadium at the rear of the stands. From each pole, twenty-four 1,500-watt lights are directed onto the playing field. On the opposite sides of the poles there are twelve 1,500-watt lights to serve the parking fields.

Mixing Plant

The two big items in the stadium construction included 4,000 cubic yards of concrete (3,000-pound strength in 24 days) and 220 tons of reinforcing steel. The steel was supplied by the Laclede Steel Co. of St. Louis, Mo., while the concrete was mixed at the job site. A siding of the Louisiana & Arkansas Railroad is located within 1,000 feet of the stadium, so the steel and cement were shipped in by rail and trucked the short distance remaining to location. Lone Star bag cement came from New Orleans and was stored in a shed having a 2,000-bag capacity.

Sand and gravel (1-inch) for the aggregate was supplied by Roy E. Merrill from a pit on the Amite River 25 miles away. It was trucked to the plant and stockpiled. Between the material piles a Jaeger 16-S 3-bag concrete mixer was set up on a platform at the north end of the job. City mains were tapped to furnish water for the mix. Darex, an air-entraining agent, was added to the mix at the rate of $\frac{1}{4}$ ounce for each bag of cement to give the concrete an air content averaging 3 percent.

Aggregate was weighed out on Fairbanks-Morse wheelbarrow scales, and the material was then dumped by hand into the mixer skip. Batches were mixed in the drum for two minutes. A flatbed International truck was fitted out with a $\frac{3}{4}$ -yard floor hopper held in place by pipe rails. The concrete was discharged from the mixer into this hopper. The hopper-truck then drove

to where the concrete was being placed and filled a Blaw-Knox $\frac{3}{4}$ -yard bottom-dump bucket. The bucket was set in a hole in the ground to permit a direct discharge from the low bottom of the hopper. A P&H 655 crane then swung the bucket over the forms. Boom lengths varied from 65 to 90 feet depending on the reach required.

With this set-up, 58 batches were placed every two hours. Weights of a typical 3-bag batch were as follows:

Cement	282 lbs.
Sand	501 lbs.
Gravel	1,178 lbs.
Water	14 gals.

Column and Beam Construction

The above-ground portions of the stadium, rows 22 to 45 along the sides, are supported on concrete column and beam construction. Each of the five side sections, either east or west, is 60 feet long between vomitoria. Each section contains four bents composed of three columns increasing in height to the rear. The bents support beams running from the foundation wall at

ground level to the top of the column at the rear wall of the stadium. The treads and risers of the step rows are strung across these beams.

Footings for the high rear columns measure 7 feet 6 inches x 4 feet 3 inches x 1 foot 3 inches deep. The other foot-

ings average 4 feet 9 inches square x 1 foot 3 inches deep. The footings are spaced about 17 feet both ways. Each 60-foot section is supported independently of the others, with a 1-inch open joint for expansion in the work above

(Concluded on next page)

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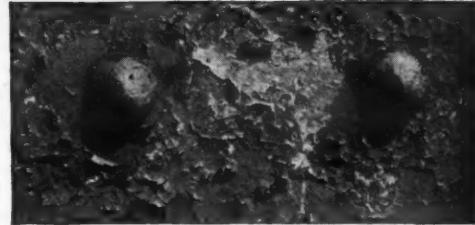
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Concrete Stadium For Baton Rouge

(Continued from preceding page)

ground, and a 1-inch mastic and copper joint separating the concrete poured for the lower rows supported on the soil.

The lower stands are supported on a 5-inch concrete slab poured on the sloping ground. A downhill thrust due to slipping or expansion is taken care of by a toe wall, 30 to 40 inches in depth below the slab and 20 inches in width. From this wall T-beam girders extend upward at ground level to the top of the lower stands so as to give support to the base slab if settlement should occur in the fill beneath. The beams are spaced on 16-foot centers and, like the toe wall, were poured in the ground without the use of forms.

Form Work

Forms for the interior 16-inch columns were built with two 2 x 8's to a

side, held together with 2 x 4 horizontal bats on 3-foot centers. Column clamps above each bat gave added support. At the rear of the stadium the columns and back wall were poured as a monolith. The form work consisted of $\frac{3}{4}$ -inch plywood backed with 2 x 4 vertical studding on 16-inch centers, and double 2 x 4 horizontal wales on 24-inch centers with snap ties.

On top of the columns in each bent two 3 x 10 stringers were laid to support the beam forms. Across the stringers 2 x 4's were set on 16-inch centers. They held the 2-inch lumber for the beam bottom. Beams are 16 inches wide x 24 inches deep. Side forms for the beams were made of 1-inch stock, backed with 2 x 4 studs on 16-inch centers. The stretch of beam between columns was supported by pine uprights or jacks, 4-inch tips and 6-inch butts, four jacks to a bay.

Between these sloping beams are the rows of concrete stands with treads $\frac{1}{2}$ inches thick and risers 5 inches thick, acting as cross beams. Treads are 26 inches wide, while the riser height varies from 9 inches at the bottom to 14 inches at the top. The treads pitch forward $\frac{1}{2}$ inch for drainage. At each row a 2 x 10 was placed on edge between the riser beams on 26-inch centers. At the center point of these $17\frac{1}{2}$ -foot bays the wooden joists were supported on adjustable steel shores jacked up to a maximum height of 30 feet. The shores rested on mud sills.

As much of the form work as possible was prefabricated in the carpenters' layout yard which was equipped with an American Uni-Point table saw and a Delta table saw. On the lower stand pours the wooden forms were made up in sections, 16 feet long x 5 rows or risers wide, which were easily picked up and set in place by a crane. Each of these sections was used seven times during the construction. In building the lower stands the general procedure, after the retaining and footing walls were poured, was to construct 60-foot sections from row 12 to 21, and later pour the 1 to 12 row sections.

With these prefab forms a crew of 8 carpenters in 7 hours could set in place an entire bay for pouring, 60 feet long, in the lower stand for either the row 12 to 21 or 1 to 12 sections. Before the pour, concrete blocks were placed on the grade, the reinforcing mat laid on the ground, and the form section set in position. The forms were then either shimmed up or pressed down to precise grade, and the steel blocked up to the proper level. Concrete was placed from the bottom up.

Steel Pans on Elevated Stands

The elevated portion of the stands, rows 22 to 45, was poured in metal pan forms that were erected by L. A. Pinner, a Baton Rouge subcontractor. The forms were made of 14-gage metal by two local concerns—Barco Steel Form Co. and Webre Steel Co. They were built especially for the job in 6-foot lengths for one riser-tread unit. Three such lengths were required for a row in the 17-foot 6-inch section between the sloping beams. The pans were set against the 2 x 10 cross joists and fastened to them with duplex nails. The nailing was done from underneath the stands by carpenters working from scaffolds. A strip of sealing paper was laid along the rear of the tread, where it joins the riser of the next form above, to prevent any loss of concrete mortar through the joint. The forms were oiled prior to the placing of the concrete.

All concrete was cured with wet burlap. The pan forms were easily removed by pulling the nails from the joists and slipping them out. The joists and the uprights were left in place to support the weight of the deck until the full 14-day curing period had passed. Holes had been made in the riser side of the forms for the insertion of ties. These holes later were used to

hold bracket bolts supporting the stadium seats.

The seat rows are 12 inches wide, made from two 2 x 6's, and are $17\frac{1}{2}$ inches high above the tread. Installation of the seats was one of the final operations in the construction of the stadium. Underneath the stands are various concession booths, together with dressing rooms and shower and toilet facilities.

Personnel

J. P. Ewin, Inc., employed an average force of 85 on the project under the direction of J. R. McClellan, Superintendent.

E. G. Blakewood, Jr., was Engineer of Design and Construction, and supervised the building contract for the Recreation and Park Commission of East Baton Rouge Parish. The stadium was designed by Blakewood and George R. Thompson, Associate Architect, both of Baton Rouge.

Remember—Safety Is No Accident!

Side-Mounted Tractor Mower

"Surveys show that there are an average of 54 mailbox posts, culvert abutments, telephone poles, etc., along each mile of highway", says J. I. Case Co., Inc., of Racine, Wis., in its circular describing the Case Detroit No. 16 highway mower. What makes the No. 16 suitable for mowing around obstructions, says the circular, is the high degree of control it affords the operator. The cutter bar of the mower is controlled with a conveniently located lever completely independent of the tractor clutch, and it can be raised or lowered hydraulically whenever the tractor engine is running.

Other features of the highway mower are presented in the circular along with illustrations and specifications of the unit and its component parts. Mowers are available for 5, 6, or 7-foot cutting widths.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 77.



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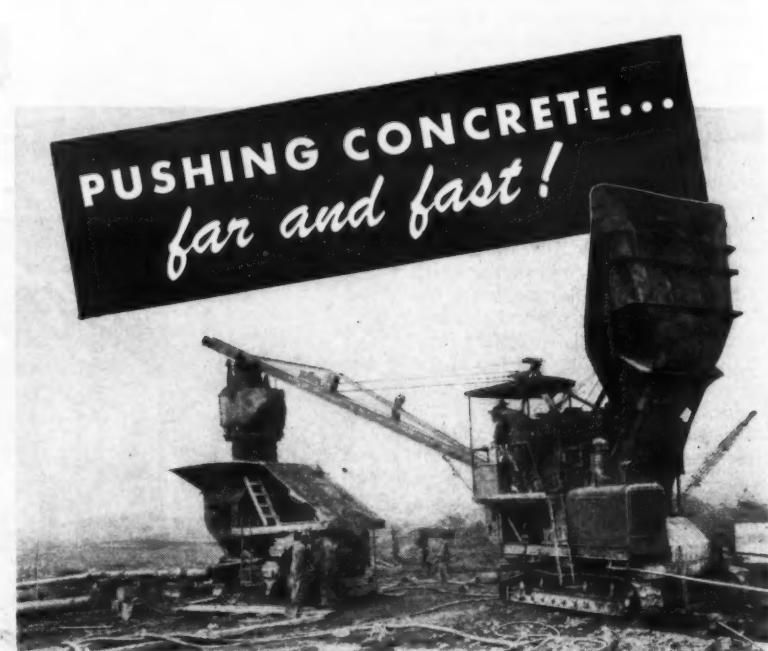
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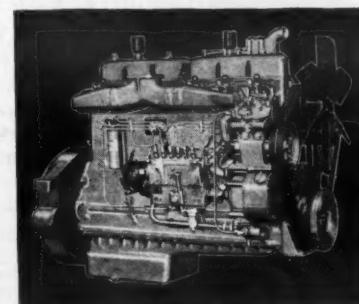


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On this Chicago Sanitary District job they're pushing a lot of concrete. The Waukesha-powered Model 200 Double Pumpcrete pushes it far—1200-ft. horizontally, or 120-ft. straight up, as you want it. And fast!... 50-65 cu. yds. an hour! It takes real power—Waukesha power—to shove a huge, heavy slug of concrete over a thousand feet long and eight inches in diameter through a pipeline that fast. It's a Waukesha Engine—Model 6-MZAU (6-cyl., 4 $\frac{1}{4}$ -in. x 4 $\frac{3}{4}$ -in., 404 cu. in. displ.) that puts the power to push behind the Pumpcrete piston.

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Waukesha Diesels particularly! With that most outstanding exclusive spherical-shaped combustion chamber! With two swirl cups in the piston crown, turbulence is controlled constantly and automatically. Burning rate speeds up or slows down, with engine speed. No complicated advance and retard mechanism in injection pump is needed.



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The Utility hydraulic hoist will lift a $\frac{3}{4}$ -ton load $7\frac{1}{2}$ inches in 45 seconds. It operates on a floor frame or truck bed.

New Hydraulic Hoist For Shops or Trucks

A new hydraulically powered shop or truck hoist has been announced by Unit Mfg. Co., 1229 Harmon Place, Minneapolis, Minn. The Utility hoist, as it is called, can be used on a 3-wheel tubular-steel floor frame, or be quickly converted for use on truck beds, workbenches, and loading docks. It is designed to lift a $\frac{3}{4}$ -ton load $7\frac{1}{2}$ inches in 45 seconds or, by using a short hook-up, 2,000 pounds 52 inches in 45 seconds.

A double-action hand-operated hydraulic pump powers the hoist. The hydraulic cylinder features O-ring seals on piston rods, heads, and other points where static sealing is required. The hoist frame is heavy tubular steel with extra reinforcing. The hoist can be easily moved from the truck if required, leaving the bed smooth for other operations. Extra wells can be placed in a number of trucks and the hoist interchanged as desired. When the hoist is mounted on a truck, its 45-inch boom will swing in a full circle; when it is mounted on shop floor frame, a special locating pin locks it in safe working position. Wheels on the floor frame are equipped with needle bearings that will not bind while rolling, it is said.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 108.

Catalog on Explosives

A 68-page manual on explosives and explosive products has recently been offered by Olin Industries, Inc., East Alton, Ill. A complete line of explosives and accessory equipment is presented in the booklet. All are fully described and complete specifications are given.

The products offered include dynamite, black powder, blasting caps, electric blasting caps, delay electric blasting caps, safety fuse, fuse lighters, cap-sealing compounds, magazines, blasting machines, tamping bags, testing equipment, and cap crimpers. Engineering and field data on special features of work with explosives are given in a series of tables at the end of the manual. Included is a long list of cautions in handling explosives.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 57.

Marion Men Promoted

The Marion Power Shovel Co. of Marion, Ohio, recently appointed three sales representatives; Ralph W. Kerr, William W. Wilkinson, and Melvin Kraft.

Ralph W. Kerr covers Michigan and western Ohio, working out of the company's general offices in Marion, Ohio. Before his promotion, Mr. Kerr was Assistant Service Manager. He succeeds John Hildinger, who is now with Depco Detroit Corp., a Marion dis-

tributor.

William W. Wilkinson's territory includes southern Indiana, southeastern Illinois, and Kentucky. His headquarters are in Evansville, Indiana. He has been with Marion for over a year.

Melvin Kraft comes to the New York City district office as sales representative. He was formerly with the company's export sales division.

Design Improvements On Small-Size Mixers

Design changes affecting both the 6-cubic-foot Model 6-P and the 10-cubic-foot Model 10-P plaster-mortar mixers have been announced by the Kwik-Mix Co., of Port Washington, Wis.

Improvements on the smaller machine enable its overall width to be reduced to 33 inches so that it can be moved through standard doorways for indoor operation. This reduction from the standard width of 44 inches is accomplished by removing four bolts and

telescoping the axle. A handy toggle and lever arrangement located near the operator now opens the drum drain plug and facilitates the cleaning of the mixer drum.

The 10-foot Kwik-Mix mixer has been improved by the addition of an

automatic water measuring tank. This is said to be a self-cleaning device that delivers the correct volume of water to every batch of plaster or mortar.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 27.

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The new Byers 1/2-yard convertible excavator features a folding boom and truck-type chassis designed for highway mobility.

A Mobile Excavator, Half-Yard Capacity

A 1/2-yard convertible excavator mounted on a mobile truck-type chassis of crane carrier design has recently been developed by The Byers Machine Co., of Ravenna, Ohio. Designed for operation as a shovel, crane, pile driver, clamshell, dragline, or back hoe, the unit has a power plant that develops 62 hp to furnish a 10,000-pound single-line pull. This Model 61-CC employs the Airflex pneumatic self-adjusting clutches to control hoist, crowd, and swing.

Crane booms up to 70 feet long, with suitable gooseneck tips, are available. The basic two-piece crane folds for highway travel. Telescopic outriggers of the I-beam type and screw jacks with floats are located in the crane carrier chassis to give the required stability when the machine is engaged in making extremely heavy lifts. When fully extended, the outriggers provide a solid 12-foot base to relieve the eight rear tires of overloading.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 62.

Sprockets and Chains

A 52-page catalog of stock sprockets and chains has recently been issued by the Cullman Wheel Co., 1344 Altgeld St., Chicago 14, Ill. Specifications, dimensions, and prices are given for a wide variety of types and styles of sprockets and chains.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 64.

Two CF&I Men Advanced

F. S. Jones has succeeded Newell H. Orr as Vice President in Charge of Sales for The Colorado Fuel & Iron Corp., Denver. Mr. Orr has retired but will continue in an advisory capacity. Mr. Jones' former position as General Manager of Commercial Steel Sales of the Western Division has been filled by James N. Counter, advancing from Rocky Mountain Division Sales Manager.

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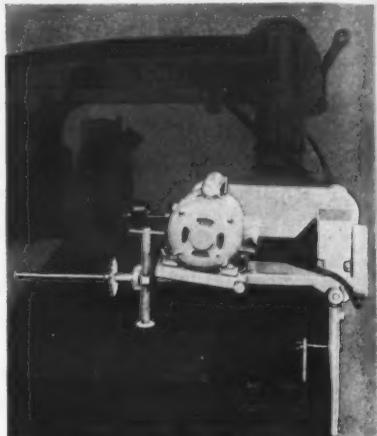
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Powered Rip Feeding With Saw Attachment

A new power rip feed attachment for radial-arm saws has been introduced by DeWalt, Inc., Lancaster, Pa. It can be attached to almost any radial-arm saw and many under-table saws with two mounting brackets which come with it. The design of the unit enables the saw operator to use it for straight rip sawing and for bevel ripping, molding, power-feed shaping, ploughing, grooving, and rabbeting, the company says. The unit may be moved out of the way once power-feed work has been completed. Hand operations may then be resumed without delay.

The unit is equipped with adjustable rollers for feeding material into the cutter and taking cut material away. Material is fed by these rollers and held firmly against the guide strip to provide accuracy in cutting operations. The belt drive of the unit may be adjusted to feed material into the cutter at rates of speed ranging up to 120 fpm.



DeWalt's new power rip feed attachment can be used with almost any radial-arm saw and many under-table saws with the aid of two brackets.

Further information on this new saw attachment may be secured from the company. Or use the Request Card at page 16. Circle No. 137.



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This low-cost, self-propelled machine uses beach sand, gravel, crushed stone or slag aggregate and various bituminous materials, including tars, cut back asphalts, road oils, and emulsions. The aggregate may be dumped directly from trucks into the Moto-Paver hopper, as shown above, or picked up from a windrow, as shown in illustration at right.

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Effective Date of Contract

Crucial in Borrow-Area Case

THE PROBLEM: For any one of many purposes, it may become important to determine when a construction contract became effective. (The date specified in the document is not necessarily conclusive.) For example, a contractor sought to collect pay for an earth dam on the basis of reasonable value of the work done as distinguished from the contract price. He claimed the owner had concealed that it would be necessary to take materials from a borrow area less favorable to the contracting company than another area. In this case it became necessary to determine when the contract was made, because any deception practiced upon the contractor must have occurred when or before the contract was entered into.

Under circumstances to be detailed, must the contract be deemed to have been made on the date of its formal execution—which possibly preceded the disclosure that some of the materials for the job would have to be taken from the unfavorable borrow area?

THE ANSWER: Yes. (Benjamin Foster Co. v. Commonwealth of Massachusetts, 318 Mass. 190, 61 N. E. 2d 147, decided by the Massachusetts Supreme Judicial Court.)

As shown at the end of this article, the court decided that in any event there was no deception of which the contractor could complain. But the part of the decision to which particular attention is drawn is that which deals with the point that a contract may be regarded as fully in force, although a plan of operation may remain to be worked out. Said the court:

"Any fraud that could be availed of as a ground of rescission must have occurred before the execution of the elaborate formal contract on August 24, 1936. The contract must be deemed to have been made on that day, even though the 'Plan of Operation' for building the embankment which the contractor 'was required by . . . the specifications to submit for approval had not then been approved. The contract itself determined the work to be done. The 'Plan of Operation' related only to the manner of doing it and was incidental. Approval of the plan for constructing the embankment was not a condition precedent to the existence of a contract. . . . The plan might or might not follow one of the five methods of which 'studies' had previously been prepared, or might follow one of them in part. Changes in it might be directed or permitted by the engineer without affecting the continuity of the contract."

The principal ground upon which the case was decided against the contractor was that, although the company was misled to some extent, it appeared that it would have entered into the contract in any event. The court referred to a referee's finding from the evidence that the company was "not misled into making the contract; that although it hoped and expected to use the lower [borrow] area, it contemplated the possibility of excavating from the upper [unfavorable] area also and 'would not have refused to enter into the contract if it had known that it would be required to do what it was tentatively planning to do.' There was nothing to show that the contractor's bid would have been substantially higher had there been no concealment. Moreover, there was evidence tending to show that the damages sustained by the contractor in having to cease taking material from the lower area was not due to the previous non-disclosure.

Validity of Employment To Secure Public Jobs

THE PROBLEM: In a suit to collect commissions for obtaining municipal sewerage engineering contracts for defendant, a jury decided that the contract of employment was void as tending to promote use of improper influence with municipal officials in securing contracts for defendant. Should a jury have been permitted so to decide under the evidence presented?

THE ANSWER: Yes. (McCabe v. Kupper, 66 Atl. 2d 629, decided by the New Jersey Superior Court, Appellate Division.)

Summarizing controlling legal principles, the court noted that, fundamentally, the Law does not favor the disavowal of contracts by persons who have received the benefit of the same. But this rule must give way "to the policy of great public concern, which condemns all agreements which inherently tend to corrupt public officials or to swerve them from the conscientious and impartial discharge of their duties."

The court observes that some judges have ruled "that every agreement for the payment

of fees for services, which is dependent upon obtaining a municipal contract, is" inherently "invalid on the theory that its contingent nature constitutes a temptation for the use of improper means." Rejecting that view, and citing high authority for doing so, the New Jersey court declared:

"In the light of the free and increasing use of contingency arrangements in legitimate business circles, we question . . . [whether] every agreement for sales to public bodies contemplates or tends to the use of improper means simply because the salesman is being paid in whole or in part on a contingent basis."

The court approvingly quoted a decision of the Massachusetts Supreme Judicial Court, where it was ruled that no single factor was decisive of the question whether a contract of this kind is void as being against public policy, and that the validity of each contract should be tested by all elements (Concluded on next page)

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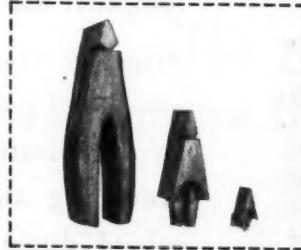
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Avoid Legal Pitfalls

(Continued from preceding page) involved—including the fact that pay was contingent, the percentage and amount of the fee, etc.

The New Jersey court followed the Massachusetts court's conclusion that, if the circumstances surrounding a particular contract conclusively show that its tendency was to promote corruption of, or undue influence upon, public officials, the trial judge should declare the contract void. If there is fair doubt on the question, it should be left to the trial jury for determination.

In this case, the court found that doubt did exist and ordered a new trial because the trial judge had ruled that the circumstances failed to show any tendency to corruption or undue influence. Accordingly, judgement in favor of plaintiff was set aside pending a new trial and a jury's verdict on the question of tendency to corrupt.

Fair Labor Standards Act Held Inapplicable

THE PROBLEM: Did the provisions of the Federal Fair Labor Standards Act of 1938 apply to employees of cost-plus contractors engaged in constructing new buildings and facilities at a naval ammunition depot?

THE ANSWER: No. (McDaniel v. Brown & Root, 172 Fed. 2d 466, decided by the United States Court of Appeals, Tenth Circuit.)

First, the court pointed out that it is now well settled that employees engaged in the original construction of a new building or facility are not within the coverage of the Act, "even though the building or facility, when completed, will be used for the production of goods for commerce or as an instrumentality of interstate commerce." A distinction is drawn between employees engaged in original construction and those engaged in repairing or making replacements of buildings and facilities already in use. "The reason for the rule is that since the new building or

facility in the original construction of which the employee works has not yet been dedicated to use in the production of goods for commerce, although it may be intended to be so used when completed, such work does not have such a close and immediate tie to the production of goods for commerce as to bring such worker within the coverage of the . . . Act."

The court upheld a lower court's dismissal of the suit, which was brought by former employees of the contractors. In addition to deciding that the Fair Labor Standards Act did not apply, the Court of Appeals concluded "that the claims of plaintiffs, based on time preliminary to the time they reported to their foremen for productive work and postliminary to the time they ceased such work, were for activities not compensable either by contract or by custom or practice and were, therefore, activities not compensable under the provisions of . . . the Portal-to-Portal Act of 1947."

An Unlicensed Contractor Loses His Suit to Collect

THE PROBLEM: A municipal sewer contractor was paid the full contract price, excepting \$1,916, covering changes ordered by the engineer. Was suit to collect that balance properly dismissed on the ground that the contractor, although legally required to secure a municipal license as such, failed to secure it until the contract had been completed?

THE ANSWER: Yes. (Bush Building Co. v. Mayor and Aldermen, Town of Manchester, 225 S. W. 2d 31, decided by the Tennessee Supreme Court.)

The theory of the decision is that where procuring a license is essential to engaging legally in business, a contract entered into without the contractor having procured the license is illegal and the delinquent has no standing to enforce it. (Comment: Many courts have rendered similar decisions, but much depends upon the precise wording of particular licensing statutes or ordinances. In some cases, the wording has been declared not to preclude enforcement of a contract. The Tennessee decision should prompt every contractor to check carefully with his local attorneys upon the necessity of securing occupational licenses before valid contracts can be secured.)

Cost of Substitute Power Constitutes an Extra Item

THE PROBLEM: The specifications of a Government construction contract stated that temporary electric power would be available "in the immediate vicinity of the contemplated work". The engineer in charge of bidding assured the successful bidder that electric power for machinery would be made available within 200 or 300 feet. Was the contractor entitled to reimbursement for the extra expense of using gasoline-driven machinery because electricity was not made available within the stated limits?

THE ANSWER: Yes. (F. H. McGraw & Co. v. United States, 82 Fed. Supp. 338, decided by the United States Court of Claims.)

In some instances electric power was not available closer than 1,000 feet, and the Government's representatives insisted that the contractor run leads from transformers for this distance. But it was undisputed that it was cheaper to substitute gasoline power.

As to the power of the Government's representatives to bind the Government by representations as to availability of electric power, the court said:

"This was a representation made to plaintiff preliminary to its putting in its bid. It was made by defendant's representative who had prepared the plans and who was on the site of the work, evidently in anticipation of

visits by prospective bidders, and to answer questions which bidders might propound. We have no doubt that the defendant is responsible for the representations made by him or by those persons to whom he referred plaintiff for information requested. See Max J. Kuney v. United States, 95 Ct. Cl. 512, 519, 521."

Federal Contract Bond Covers Minimum Wages

THE PROBLEM: Did the supposition that a bankrupt Federal contractor may have used good faith to comply with the requirement of the Walsh-Healey Act, which states that labor is not to be paid less than the minimum wages prescribed by the Secretary of Labor, exonerate his surety on a bond binding the contractor to pay all employees, without rebate or deduction, such minimum wages?

THE ANSWER: No. (United States v. Continental Casualty Co., 85 Fed. Supp. 573, decided by the United States District Court, Eastern District, Pennsylvania.) The court remarked that Congress could not possibly have intended to render the minimum-wage requirement futile, as it would be if interpreted in the manner surety company's lawyers argued it should be—as meaning that contractors must agree "in good faith to endeavor to maintain the minimum wages as determined by the Secretary of Labor."

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Cantilever Forms Shape Giant Dam

New-Type Steel Forms Reduce Normal Anchors and Speed Building of Bull Shoals Dam

By RAYMOND P. DAY,
Western Editor

(Photo on page 1)

♦ A NEW-TYPE cantilever steel form, used only on three other dams so far as is known, is currently speeding the construction of Bull Shoals Dam near Mountain Home, Ark. Ozark Dam Constructors, which has the \$22,146,440 Corps of Engineers contract for the multiple-purpose project (see C. & E.M., April, 1950, pg. 24), plans to shape about 2,000,000 square feet of surface on the big concrete barrier with the new forms.

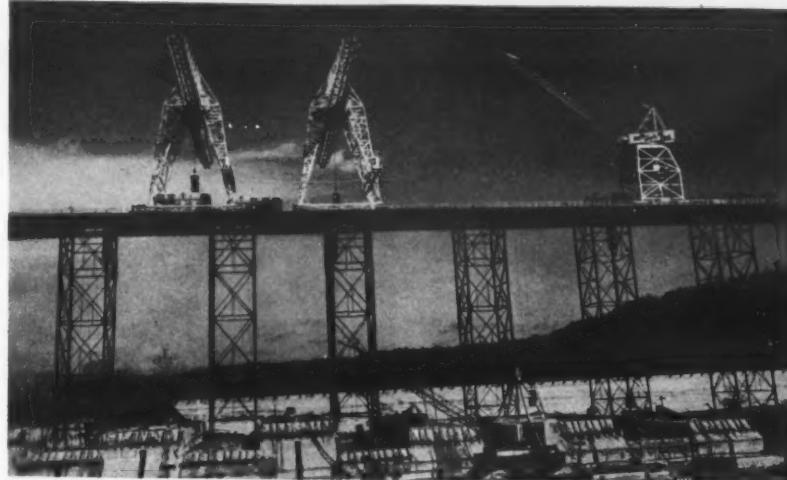
The steel forms are of the new cantilever type developed since the war by Blaw-Knox Co. They were first used on Wolf Creek Dam in Kentucky, and, since then, on Fall River Dam in Kansas and East Sidney Dam in New York. They are a direct copy of the wooden cantilever forms used at Friant Dam, according to Harvey Slocum.

A unique feature of the forms is the elimination of tiebacks conventionally used. The Blaw-Knox form is anchored to the block of concrete previously poured. This new approach permits elimination of about 60 to 75 per cent of the anchors normally used, and achieves economies not obtainable in the past. There are savings in time and handling costs, too, because the forms can be raised in just a period of a few hours.

The steel forms are designed for concrete lifts 5 feet high. They are usually in panels 10 feet long, with a few odd lengths where required. Each 10-foot panel has two cantilever uprights. The forms are held by 1 1/4-inch Richmond screw anchors, two being required for each panel. This places the anchors on 5-foot centers in single rows. Anchors for successive lifts are set by template bolts through the tops of the forms.

The panels are clamped solidly in place after being raised. Adjusting bolts are provided near the top of the form for any necessary adjustment to true line. No shimming or blocking of the cantilevers is necessary. Steel brackets and angle railings are also provided, if necessary, for an outside scaffold or working platform. Stripping bolts, to make that operation easier, come with the forms. Cleanout openings are spaced along the forms and come in very handy at Bull Shoals Dam, where all the surface joints have to be cleaned by sandblasting.

The normal deflection outward, under the load of a 5-foot lift, is only about 1/8 inch, and this can very easily be compensated for by setting the forms initially that distance inside the theoretical line. They are then adjusted if necessary during the pour. It has also been necessary to use pipe jacks between the tops of the sloping



Corps of Engineers Photo

Two hammerhead and two revolving cranes place concrete at Bull Shoals Dam.

face forms and the previously poured concrete, to keep the top of the form from dipping down.

Specifications call for coverage of

each monolith by another 5-foot lift in 15 days. Should that be impossible to attain, two 2 1/2-foot lifts must be placed before the 5-foot pours can be resumed.

Placing Main Dam Blocks

The general concrete-placing scheme at Bull Shoals Dam consists of high trestle work, with double cantilever cranes handling the bulk of concrete. This is especially true in the case of the main dam monoliths. It has been necessary to transfer some of the concrete, particularly in the lower spillway apron slab, by means of a secondary revolving crane.

In the placing of any main dam monolith, the previously poured surface is first sandblasted perfectly clean, exposing the surface of the aggregates. Then the sandblast residue is blown off through the cleanout holes of the steel forms by a jet of water and air. Compressed air reaches the dam from the compressor building on top of the right abutment through a 6-inch air header. One of seven railroad cars has a full-time assignment holding and carrying sand for the sandblasting operation. Form lining is installed only after sandblasting is finished.

(Continued on next page)



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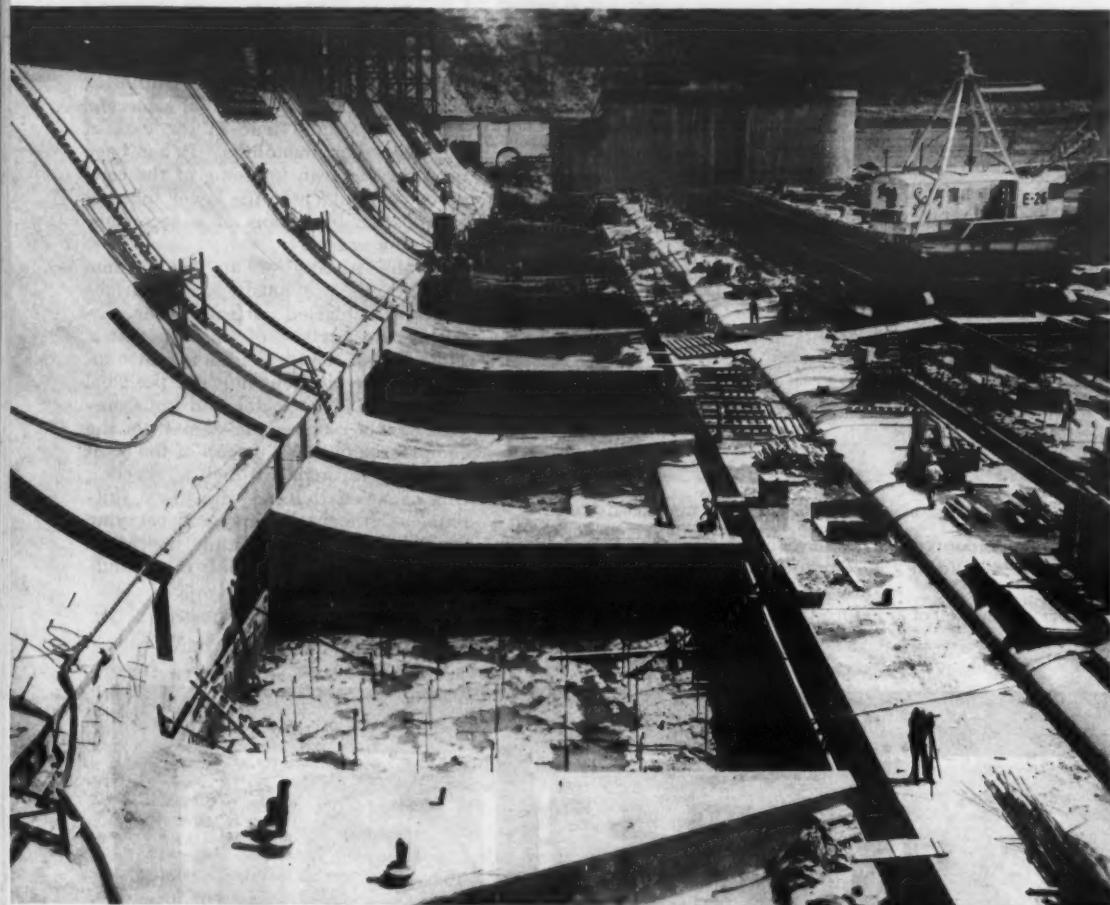


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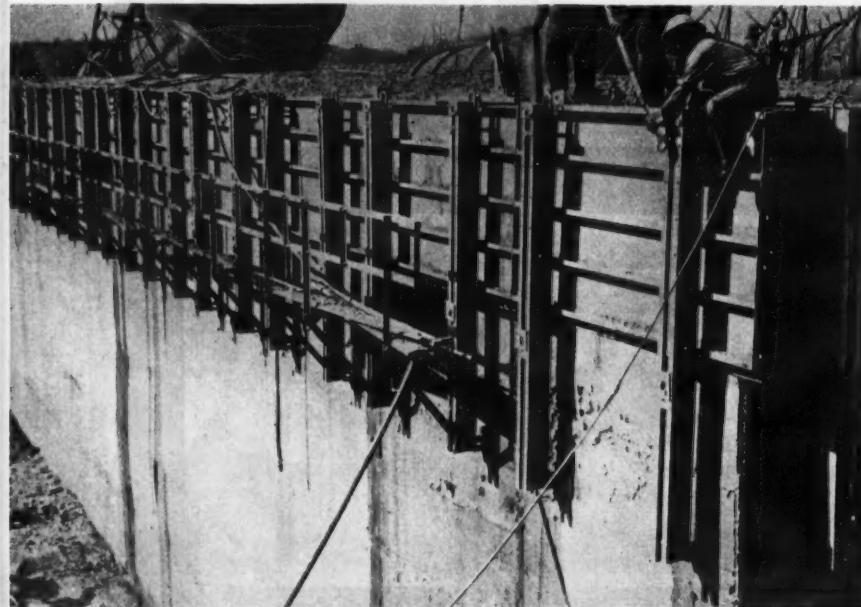


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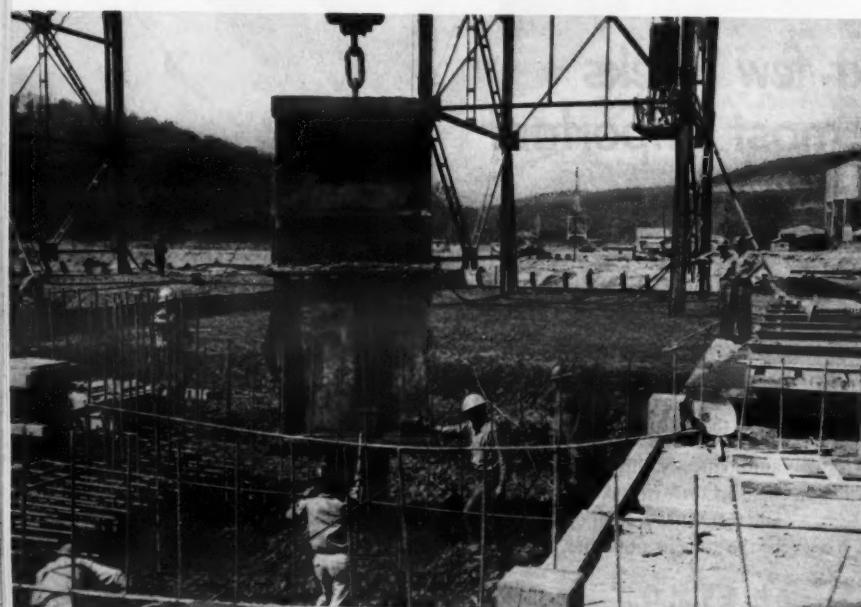
Corps of Engineers Photo

This view was taken from the right training wall of Bull Shoals Dam looking toward the left training wall across part of the stilling basin. Ozark Dam Constructors has the \$22,146,440 Corps of Engineers contract.



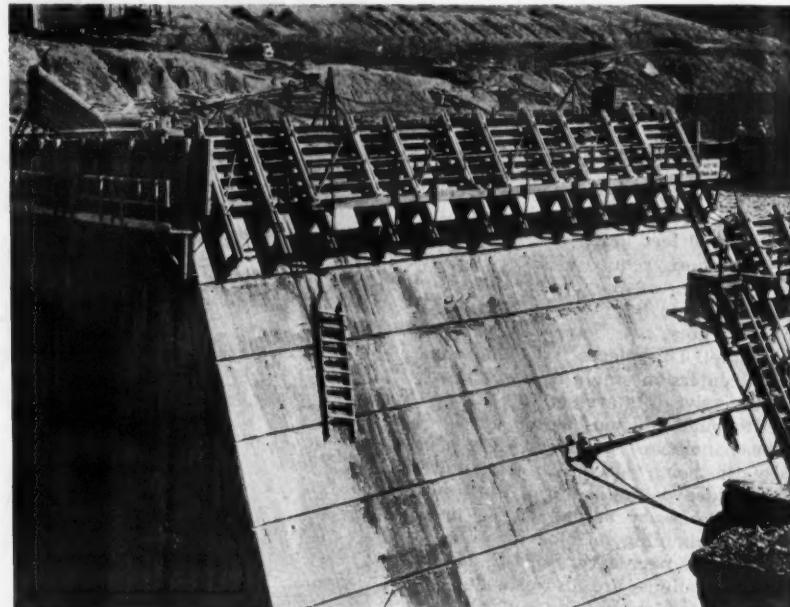
Corps of Engineers Photo

Bolts in the Blaw-Knox steel cantilever-type forms anchored to the block of concrete previously poured are removed so the forms can be lifted to the next pouring position.



Corps of Engineers Photo

As the bottom doors of a Blaw-Knox bucket are swung wide open by a pneumatic cylinder and piston, concrete whooshes out into lift 484 of monolith 35.



Corps of Engineers Photo

Here are bulkhead and downstream face forms. Bracket outriggers at the top and wheels on lower parts of the cantilever uprights make proper handling easy.



Corps of Engineers Photo

The bucket is hoisted away and men go to work with Chicago-Pneumatic two-man vibrators to consolidate the batch of concrete in monolith 37.

Steel Cantilever-Type Forms Shape Giant Dam in Arkansas

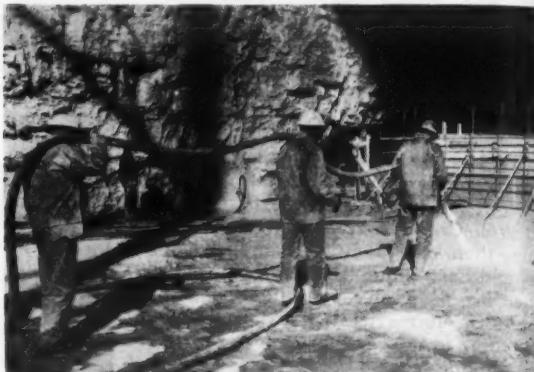
(Continued from preceding page)

There are six 10-ton locomotives built on the job from Caterpillar engines and G-E motors, used to haul the 5-stall concrete cars. One man operating through remote controls from the flatcar can move his train, hook and unhook the concrete buckets as the cranes handle them, and watch out for things generally.

As each train moves out from under the concrete-mixing plant it carries four 4-yard Blaw-Knox concrete buckets, built to Corps of Engineers specifications. There is room for five buckets on each car, but the fifth spot is always reserved for the empty coming down from the cranes. The trainload of concrete moves out over the top of the high trestle to position under the hammerheads.

Placing cranes include two Colby 300-foot double cantilever rigs, and a full-revolving American. These

(Continued on next page)



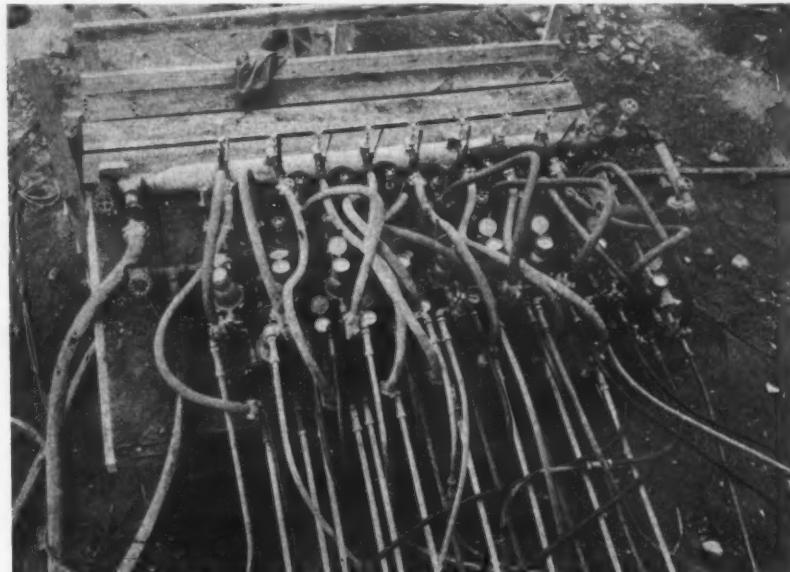
Corps of Engineers Photo

Wet sandblasting cleans and prepares lift joints for the next pour at monolith 38.



Corps of Engineers Photo

At the upstream form of monolith 26, Hydron absorptive form lining in place.



Corps of Engineers Photo

At the downstream end of monolith 33, a cooling pipe manifold set-up.

machines ride along on a railroad track on top of the trestle. There is also a trestle-mounted Washington revolving crane at a much lower level near the toe of the stilling basin. This machine handles concrete which must be transferred beyond the reach of the cantilevers on some of the apron slabs.

After the train operator unhooks an empty bucket and attaches the crane hook to a loaded one, he steps nimbly aside and gives the hoist-away signal. From that point the control of the loaded bucket of concrete is handled by a signalman who communicates with the crane operator by telephone. Careless handling of such a heavy weight could easily be disastrous, so extreme caution is the rule. Many of the operators are youngsters fresh from Arkansas farms, but they are doing fine.

The loaded concrete buckets are lowered to the pour. When the bucket is properly spotted to dump, one man steps up and quickly attaches a compressed-air hose to the dump mechanism of the Blaw-Knox bucket. There is no straining or tugging at levers. A pneumatic cylinder and piston cause the bottom doors to swing wide open, and the concrete whooshes down the vertical sides of the bucket in a big plug, dropping without extensive segregation into the pour. The bucket is then hoisted away, while men with four Chicago-Pneumatic 2-man vibrators consolidate each batch of concrete.

The only finishing these heavy monoliths require is hand tamping the large pieces of aggregate on the top. Later on, the top is sandblasted to get ready for the grout which precedes concrete on

(Concluded on next page)

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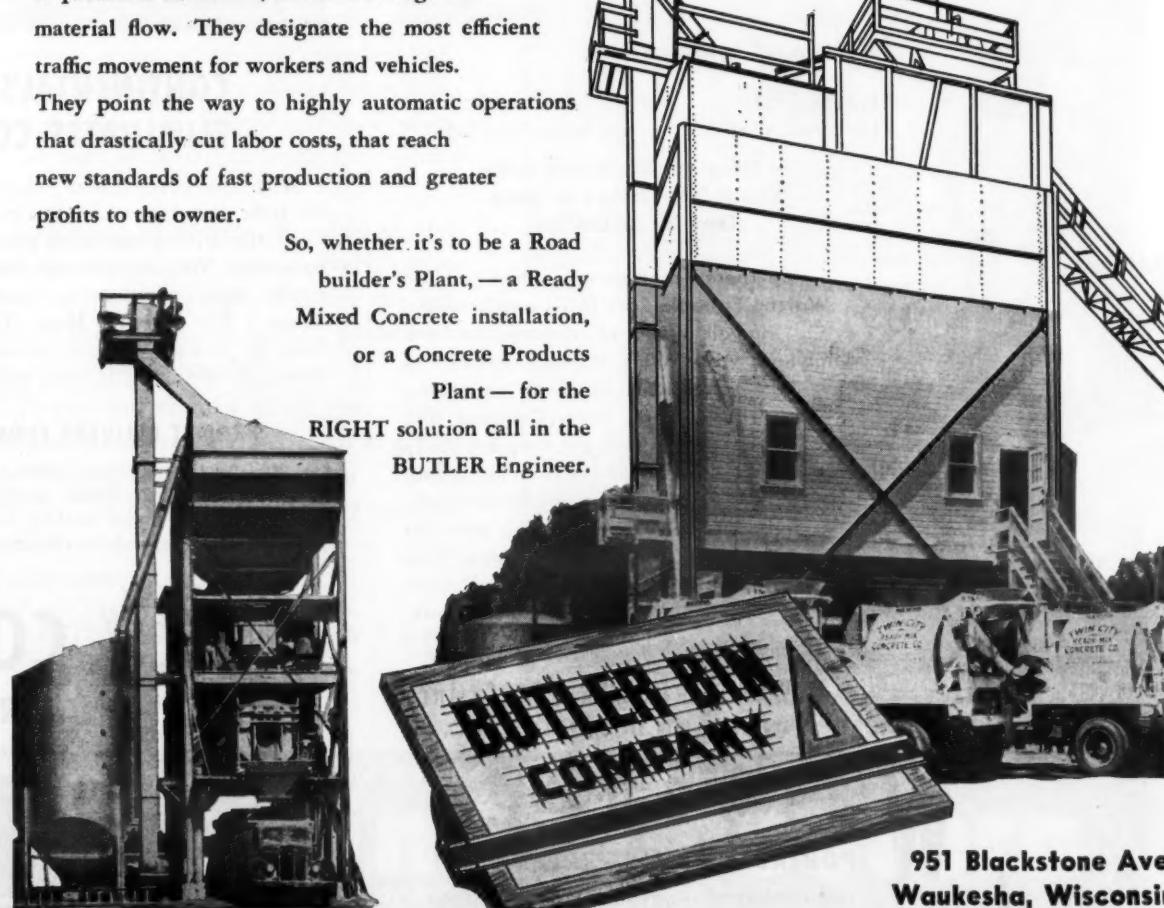
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Cantilever Forms Shape Giant Dam

(Continued from preceding page)

each pour. A 9-man crew ordinarily handles concrete quite easily.

Pouring rates on the main monoliths have hit 300 cubic yards an hour, and since concrete work began in the fall of 1948, 100,000 cubic yards was placed in a month. With the completion of changes in the plant, coincidentally with the second-stage river diversion, it was expected that production would soar toward 180,000 cubic yards per month. That is plenty of concrete in anybody's language.

Flat Slab Pours

The flat slab pours in the lower end of the spillway were handled generally the same way, with the exception that it was necessary to transfer nearly all of this concrete. Heavy 12 x 12-inch timber transfer platforms were made so the cantilever cranes could set the 4-yard buckets down on timber instead of the green concrete slabs. A Washington revolving crane then picked up the buckets and swung them over the pour, where they were dumped and vibrated in the same manner as the buckets were handled on the dam.

Several types of surface finish have been used on the flat slabs. Whiteman power finishers have been used, common wood floats, and long-handled bullfloats. For this particular place, it is believed that surface strength to resist cavitation is of paramount importance.

Levels are assured on flat slabs by the use of pipe screeds, set accurately by surveyors. The exposed surface of concrete is being cured by Hunt Proc-

ess concrete curing solution. The flat joints on the dam, of course, are water-cured.

Form Lining Used

Various types of form lining have already been tried on the dam concrete, in an effort to case-harden the surface. Hydron has been the principal substance used to date, although some Celotex absorbent form lining has also made its appearance. None of the material can be used more than once, of course.

Exactly how to get Hydron to stay on the steel cantilever forms was quite a puzzle. Then one day an interesting demonstration was made by Irvington Form & Tank Corp. This firm introduced magnetized chains to the job. The magnetized chain, gripping the steel forms through the Hydron lining, holds it securely. Then as the concrete builds up inside the forms, men simply slide the chains farther up out of the way, disturbing the Hydron none at all. It is believed that these magnetized chains may be used generally for the balance of the project.

Personnel

Personnel connected with mixing, cooling, and placing of concrete are headed by Ed Shipp, with Ben Clark in charge of rigging, penstock installation, etc.; Bill Goff in charge of the railroad and cement unloading; and Bill Lucas and Einar Skinnarland in charge of river diversion. These men, of course, all work under the general supervision of M. H. Slocum.

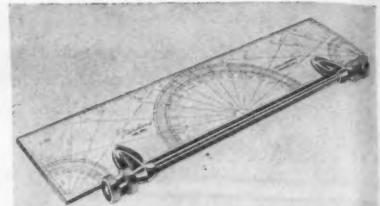
Despite the fancy design, many openings at bad angles through the concrete, a big job and a bigger labor problem, Bull Shoals Dam is making excellent progress.

New Drafting Device

A pocket-sized "drafting machine" has been announced by Loomis Industries, 516 Park Way, Piedmont, Calif. The Paraline, as it is called, measures 10 1/4 x 3 3/16 inches overall, and is constructed of a sturdy transparent section with precision-machined metal moving parts. The combination of a 32nd-inch scale and protractor with the moving parts is designed to make the instrument useful as a T-square, parallel rules, triangle, or "drafting machine."

Self-contained, the device requires no clamps or board mountings to remain in alignment. Parallels are scaled without raising the instrument from the board—useful for cross-hatching. Angles and tangents are projected by aligning the transparent protractor anywhere along a base line and rolling the instrument until the straight-edge intersects the base line at the point at which the angle is to be drawn.

Further information may be secured

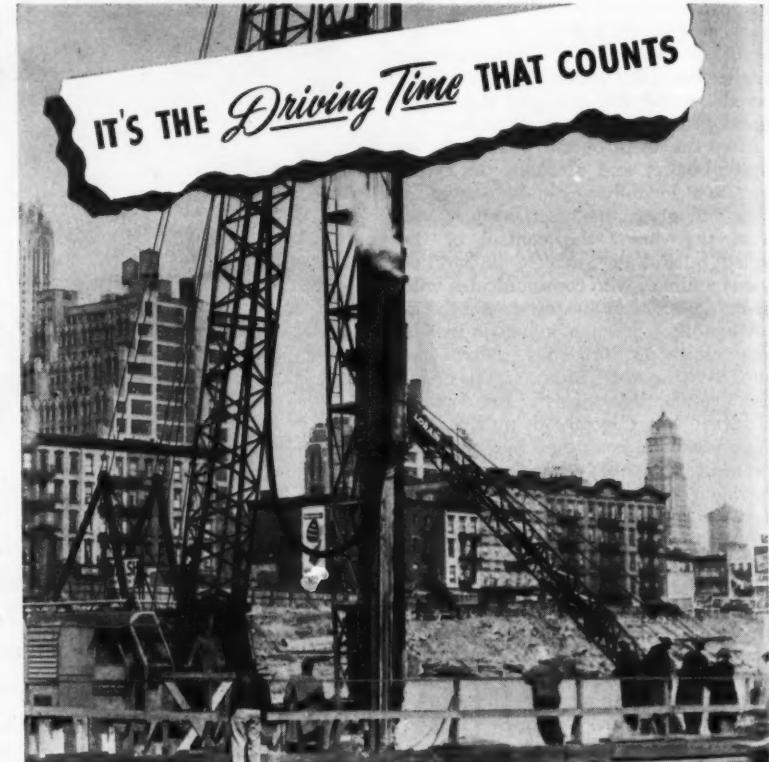


The new Paraline drafting tool made by Loomis Industries may be used as a T-square, parallel rules, triangle, or "drafting machine".

from the company. Or use the Request Card at page 16. Circle No. 10.

Holmskog Moves to Wausau

Otto Holmskog, Construction Engineering Supervisor for Employers Mutual Liability Insurance Co., has been transferred from Milwaukee to the company's home office in Wausau, Wis. Mr. Holmskog was Chairman last year of the National Safety Council's Construction Section and is a current member of its Advisory Committee.



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New Tool Lays Cable Below Ground Surface

A new device for laying cables from 2 to 3 feet underground has been developed by the Ryan Construction Co., 521 N. Fifth St., Chariton, Iowa. The unit is pulled by a crawler tractor from 60-hp up, depending upon the depth of the cut and type of soil encountered.

The cutting blade is designed to take the cable down the back edge of the cutter through a sloping guide tube which is provided with sealed ball-bearing guide wheels, thus enabling the cable to run free and lay loose in the bottom of the trench. The cutter may be adjusted for a depth of 24 to 36 inches by a hydraulic control on the machine. It cuts a narrow slot which closes behind the machine, thereby permitting the cable to be laid through streets and highways without hindering traffic. A 4-foot-diameter reel of cable can be mounted on the machine. Where a larger reel is to be used, a hitch is provided at the rear for a reel cart.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 53.

Fluid Drive Offered On 50 Truck Models

Gyrol fluid drive is now offered by the Dodge Division of the Chrysler Corp., Detroit 31, Mich., on trucks with nominal ratings of $\frac{1}{2}$, $\frac{3}{4}$, and 1-ton. The gyrol fluid drive is included on 50 truck models with gross vehicle weights ranging from 4,250 to 10,100 pounds.

Fluid drive is designed to give safer rides, easier and smoother starts, better tire mileage, less wheel-spin in mud or slush, and to cushion more than 80 vital parts against driving shock, the manufacturer states. Dodge also points out that driving is less tiring with fluid drive—you can speed along in high, creep along in heavy traffic, then speed up again, all without touching the gearshift lever or clutch.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 84.

Data on Utility Hoist

A circular describing the Porta-Utility gasoline-engine hoist indicates that the Type 160 has a lifting capacity of 1,500 pounds at 150 fpm, while the Type 160 HS will handle 800 pounds at 275 fpm. The manufacturer also lists other pertinent data on the general-purpose portable hoist, suggests applications, and gives illustrations.

This literature may be obtained from Superior-Lidgerwood-Mundy Corp., 7 Dey St., New York 7, N. Y., or by using the Request Card at page 16. Circle No. 36.

Blackburn of Euclid Dies

J. R. Blackburn, Manager of the Hibbing branch of The Euclid Road Machinery Co., Cleveland, Ohio, died on March 25. Mr. Blackburn joined Euclid in 1935 as District Manager of the Minnesota territory. Before coming to Euclid he was a sales representative for Borchert-Ingersoll, Inc. of St. Paul, Minnesota.



This underground cable layer, developed by Ryan Construction Co., places cable 2 to 3 feet below the surface. It cuts a narrow slot, which closes behind the machine.

Steel-Building Line

A line of packaged steel buildings which the purchaser himself can erect without special tools or special skills has been fabricated by H. D. Campbell Co., Rochelle, Ill. The line includes storage warehouses, garages, machine sheds, etc. The buildings are available in widths up to 24 feet, in any desired length. The side walls come in 8-foot-wide sections, 6 or 8 feet high.

The buildings are made in steel and in aluminum, galvanized or painted with a heavy base gray. Features include paneled gables and die-formed eaves, U-channel draw-type connectors, and complete insulation. Doors and windows can be selected from standard window stock and inserted where desired. Roof trusses are designed for wood sheathing so that any type of shingle can be used. Any type of siding may also be used.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 70.

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Additional values are offered by specialized attachments—many exclusively Austin-Western—which greatly increase the usefulness and day-in and day-out profit making ability of the graders.

Power and control at all four wheels has been pioneered and perfected in grader application by Austin-Western. . . . The "88-H," "99-H," and Master "99" set performance standards unequalled in power grader history.



"88-H" Ditching around short radius curves is easy for an "88" or "99"—impossible with any other grader.



"99-H" All-Wheel Drive and Steer make it possible to slope banks beyond the reach of any other grader.



Master "99" All-Wheel Drive and Steer make it safe to drive close to the jagged edge of a steep bank.

AUSTIN-WESTERN COMPANY
Aurora, Illinois, U.S.A.

BUILDERS OF ROAD MACHINERY
Austin Western SINCE 1859





The Domor attachment converts a Caterpillar motor grader into a one-man self-propelled elevating grader.

Changes Motor Grader To Elevating Grader

A Caterpillar motor grader may be converted into a one-man self-propelled elevating grader by the use of the new Domor attachment made by Ulrich Products Corp., of Roanoke, Ill., in cooperation with Caterpillar Tractor Co., Peoria, Ill.

In making the conversion, the standard blade, circle, and drawbar are removed and the elevating carrier is supported under the main frame. A 30-inch disk plow is drawn by a plow beam attached to the standard drawbar connection. The 42-inch carrier is driven by power take-off from the motor-grader engine and has a normal speed of 400 fpm, according to the company. It is equipped with a 4-ply corrugated-top conveyor belt firmly connected by metal hinges. Carrier rollers are mounted on ball bearings. An auger-type pan cleaner is driven by protected gears.

The standard carrier is 19 feet in length. For casting work, a 3-foot section can be removed, reducing the length of the carrier to 16 feet. Carrier lift is operated by cables powered by regular blade controls. The upper end of the carrier is lifted by the right-hand blade control, and the lower end is connected to the blade side-shift control.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 23.

Tubular Steel Scaffolds

A 4-page folder describing the tubular steel scaffolds manufactured by the Advance Scaffold Division of Beaver Art Metal Corp., Box 792, Ellwood City, Pa., is available. This

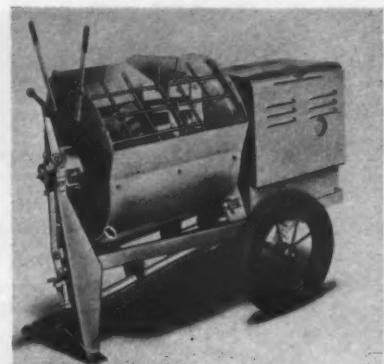
folder, No. A 5, illustrates and describes the standard end and brace sections offered by the company.

The scaffold's main components, panels and braces, are all self-contained and require no tools for erection. Braces are equipped with cam locks. By holding the cam in a horizontal position, inserting it in the socket in the panel, and turning it down, the user completes the assembly. The standard span, according to the folder, is 7 feet, but braces are available for spans of 6, 8, and 10 feet. Accessory items described include brackets, foot plates, bases, guard posts, ladders, and casters.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 28.

New Hoe-Type Mixer

The new DeLuxe Wonder hoe-type mixer for use in mortar, plaster, and concrete-products work, features a 6-cubic-foot drum capacity and triple hoe mixing. It is manufactured by the



The DeLuxe Wonder hoe-type mixer for mortar, plaster, and concrete is shown equipped with a special grating and bag splitter. It is a CMC product.

Construction Machinery Co., Box 120, Waterloo, Iowa. Sealed hoe and jack-shaft bearings, renewable blades, telescoping axle, and adjustable scraper blades make the machine flexible and adaptable, the company says.

The mixer can be obtained with

caster-type wheels, giving an overall width of 31 inches for inside work. A special grating and bag splitter (illustrated) are also available. For heavy-duty work, a high-test abrasion-resisting steel liner can be installed in the field or ordered as original factory equipment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 30.

Salesmen for Federal Motor

Keith Holbrook has been appointed factory sales representative for Federal Motor Truck Co., Detroit, Mich., in the Salt Lake City region. He is now supervising factory sales programs and dealer relations for the company in Utah, Arizona, Nevada, northwest Wyoming, and lower Idaho.

E. R. Guy is now factory sales representative in the Des Moines area. His territory includes Iowa, Nebraska, southeast South Dakota, and the Mississippi River counties.



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...for faster, cheaper
and quieter drilling

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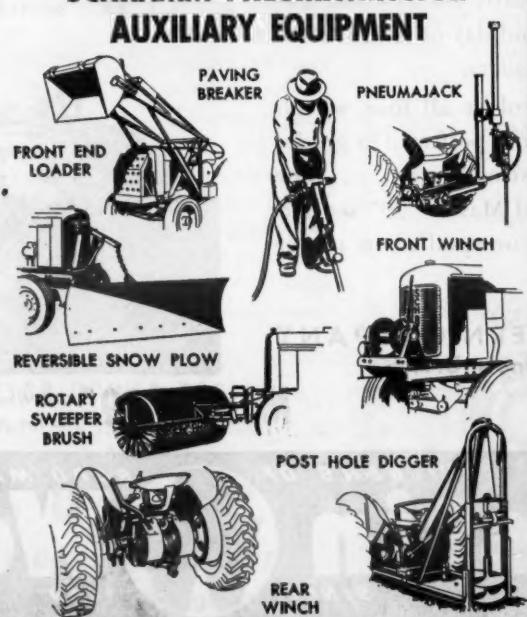
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The Compressor People
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Local Aggregate Used For Plant-Mix Paving

Sand-Asphalt Black-Top Laid On 21-Mile Job by Alabama Highway Forces; Two Driers Set Up at Plant

THE Alabama Highway Department has repaved the 21-mile Fort Morgan Road, the most southern highway in the state, with a plant-mix sand-asphalt surface. This scenic route, along the narrow peninsula that separates Mobile Bay from the Gulf of Mexico, runs from State Route 3 westward to Fort Morgan State Park. At the park are the ruins of old, historic Fort Morgan whose guns defended the entrance to Mobile Bay in the War Between the States.

The black-top paving, 20 feet wide, was done by highway department forces using local aggregate in the plant-mix. Work started the middle of March, 1949, and was completed by the end of May. The original Fort Morgan Road was constructed 12 years ago of sand-asphalt, mixed in place by motor graders to a width of 20 feet. During the last war the old fort was reactivated, and the lightly built road that provided the only access took a heavy pounding from military vehicular traffic. The pavement cracked and broke up, and became marked with holes and depressions.

In preparation for the repaving, the highway maintenance forces set up an asphalt plant at the eastern end of the project, a short distance west of State Route 3. Adjoining the plant site was a hill of beach sand that supplied half the aggregate for the mix. The other half came from a borrow pit 3 miles from the plant. The material from the pit consisted of about two-thirds sand of a somewhat coarser variety than the beach sand, and the remaining third was composed of clay and a small amount of topsoil.

Local Aggregate Used

In using these local aggregates, the Highway Department effected a considerable saving, since no other materials were available in this area. Transportation charges would have been high if aggregate had had to be

hauled or shipped to the job site from commercial sources. The borrow pit was worked by an Osgood ½-yard dragline, which excavated to an average depth of 3 feet where a heavy undesirable stratum of clay was encountered. The material was hauled out in nine 5-yard trucks and stockpiled at the plant.

The beach sand, available in unlimited quantities in the hill, was dozed up into another stockpile by an International TD-18 tractor with blade. Between the two stockpiles was the 12-yard receiving hopper of the plant, which was charged by a Lorain crane equipped with a 30-foot boom and a ½-yard clamshell bucket.

Bitumen for the mix, AC-12 asphalt, was supplied by the Shell Oil Co. and shipped from Norco, La., in 10,000-



C. & E. M. Photo
The asphalt plant on the Fort Morgan Road repaving was a combination of Barber-Greene and Cedarapids units. Twin B-G driers were needed for the wet borrow-pit sand.

gallon tank cars to a Louisville & Nashville Railroad siding along State Route 3, about 11 miles from the plant site. The transfer was made in two Dodge tank trucks holding 800 gallons apiece. A Bros tank-car heater raised the temperature of the asphalt in the cars, and

pumped the bitumen into the transfer trucks. At the plant a Kinney 3-inch pump, driven by a gasoline engine, unloaded the trucks into two asphalt storage tanks with a combined capacity of 22,000 gallons.

(Continued on next page)

ALABAMA PIPE COMPANY

General Sales Offices

ANNISTON, ALABAMA

Takes pride in announcing the resumption of pressure pipe manufacture at its recently completed modern plant located at Anniston, Alabama. This plant will produce Super deLavaud cast iron pipe, centrifugally, in modern long lengths.

Inquiries addressed to our nearest sales offices will be appreciated.

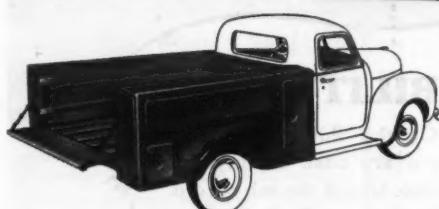
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"Carry-All's" exclusive design and its extensive tooling and engineering make possible heavy gauge steel construction (with the correct gauge for each component) and a unique bridge-type underbody . . .

And these make possible huskier construction with lighter over-all weight and fewer number of parts than any comparable body on the market—the MORRISON "Carry-All" has greater carrying capacity for gross vehicle ratings!

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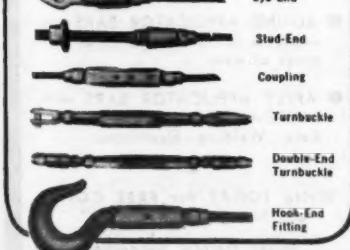
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Electroline Company
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CHICAGO 9, ILLINOIS

Local Aggregate Used For Plant-Mix Paving

(Continued from preceding page)

Fuel oil for plant operation was obtained from Mobile, about 50 miles distant, and stored in an 8,000-gallon tank. Water for the horizontal-type Lucey boiler, which burned bunker C fuel oil, was taken from a pit 4 miles distant. It was pumped into the 800-gallon tank trucks by a 3-inch pump and transferred at the plant into two storage tanks, each holding 800 gallons.

Twin Driers at Plant

The asphalt plant where the materials were mixed was a combination of Barber-Greene and Cedarapids units. Barber-Greene equipment comprised the initial half. At the receiving hopper, the crane handled the aggregate from the two stockpiles—a bucket from one pile, and then a bucket from another. A double feeder at the bottom of the hopper moved the material to a 25-foot



C. & E. M. Photo

A load of hot plant-mix is discharged by a Chevrolet truck and laid by an Adnun Black Top Paver on Fort Morgan Road in Alabama.

cold elevator which raised the aggregate to twin parallel B-G driers.

Each drier is 20 feet long x 4 feet in diameter and is heated by a Hauck oil burner which throws its long flame into the interior from the outlet end of the drums. Twin driers were a necessity because of the wet sand that was taken from the borrow pit; the sand never did get a chance to dry out in the stockpiles, with the frequent spring rains that fell in this Gulf Coast section of Alabama.

The three B-G units in this part of the plant—feeder, cold elevator, and twin driers—were driven by a Buda K428 gasoline engine. The three Cedarapids units making up the last portion of the plant—hot elevator, pugmill, and conveyor loader—were operated off an International UD-18 diesel engine.

Mix in Pugmill

From the driers the heated aggregate entered the Cedarapids portion of the plant, first climbing up a 25-foot enclosed hot elevator and spilling out over a 3 x 5-foot screen with a $\frac{1}{2}$ -inch mesh. Material passing the screen dropped into a 2-ton-capacity bin, while the oversize was chuted off to the side. From the storage bin the sand was weighed out on Kron dial scales before it entered the 1-ton pugmill where it was mixed for 1 minute with the AC-12 asphalt.

The bitumen in the storage tanks was transferred by a gravity pump to a 1,200-gallon rectangular booster tank buried in the ground where its temperature was raised to 350 degrees F. A pump on the plant drew out the

asphalt through a steam-jacketed line into a tank from which it entered the pugmill. The resultant plant-mix was then chuted onto a conveyor belt, 25 feet long x 30 inches wide, which fed it into the waiting trucks. The belt was tilted upwards so that the trucks easily backed under its raised end.

The hot-mix was hauled out on the road in a fleet of 10 trucks—7 Chevrolets holding 5 tons each, and 3 International K-8's of 8-ton capacity. The maximum haul was 21 miles to the far western end of the job at Mobile Point where the fort is located.

On the Road

Prepaving operations consisted of a careful sweeping of the old pavement with a Grace power broom pulled by a Jeep. Then the surface was given a tack coat of RC-2 asphalt applied at the rate of 0.18-gallon to the square yard by a Littleford 1,080-gallon distributor mounted on a Federal truck. The shot of bitumen was put down at 165 degrees F for the full width of the road. A light coat of beach sand was spread over the asphalt by hand to prevent it from picking up. Within a week the hot-mix pavement was being laid.

While only a single course of blacktop was scheduled for this project, a leveling course was spread wherever it was needed to patch holes and depressions or to fill in low spots. In some places these low areas took as much as 8 inches of material before they were leveled off with the adjoining road sections. On this leveling the material was dumped by the trucks and spread out by a Galion motor grader.

The finished surface course was laid by two Adnun Black Top Pavers to a loose depth of 1 inch which compacted under rolling to a $\frac{3}{4}$ -inch thickness. The rolling was done by a Galion tandem roller, 5 to 7-ton size. No water was put in the wheels; it was kept to the 5-ton weight. The usual procedure was to use one paver for half a day laying a 10-foot lane, and then bring the pavement up full width in the afternoon with the other machine. Traffic was maintained during the paving operations.

The Mix

For the leveling course a smaller amount of asphalt was used than in the surface course. The weights of a typical 2-ton batch of each mix were:

	Leveling Course	Surface Course
	Pounds Per Cent	Pounds Per Cent
Asphalt Sand	130 1,870 93.5	156 1,844 92.2
Total	2,000 100.0	2,000 100.0

(Concluded on next page)

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SHARP CUTTING POWER

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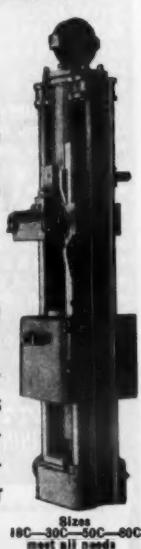
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In solving your pile driving problems, consider these facts about Warrington-Vulcan.

- Simple Design
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This durable hammer is designed to meet requirements set up by experienced contractors. Write for complete details and the name of your nearest distributor.



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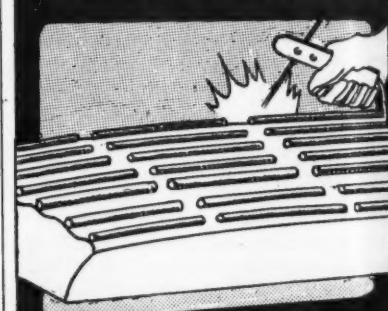
The bite is built into Omaha Buckets—to give a better performance for every cast, on any job. Takes a full load every time. Check the job record. You'll find that Omaha Buckets are Profit Buckets.

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REBUILD WORN CRUSHER JAWS



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91 N. J. Railroad Ave., Newark 5, N. J.

Paving started at the east end of the job and worked west toward the fort. In this way the trucks hauling the hot-mix were always traveling over the improved highway. Paving started at 6 a.m. and continued until 5 p.m., with the average daily production running between 400 and 500 tons. The paving crew consisted of a foreman, paver operator, roller operator, and 5 laborers. Where the road widened out beyond the 10-foot lanes that the paver was laying, the laborers raked out the hot-mix to cover the old pavement. This feathering at the edges usually occurred only at the curves.

In order to get this early start on the road in the morning, the plant was generally started up at 2 a.m. A Le Roi 60-cfm air compressor was available to provide compressed air for the firing until steam was raised in the boiler. A crew of 12 operated the plant. Another force of 7 worked in front of the paving doing the necessary patching. Some of the maintenance workers were housed in an old CCC camp at Gulf Shores at the eastern end of the job; the rest were driven to work every day from Camp Baldwin, 40 miles to the north.

Personnel

Alabama Highway Department personnel responsible for this smooth-riding yet economical 21 miles of black-top highway include W. Douglas Watson, Superintendent of the project; Rogers Pruitt, Resident Engineer; and Ralph H. Parker, Inspector.

The Department is headed by Ward W. McFarland, Highway Director. George W. Phillips is Chief Engineer, Bureau of Maintenance.

Improved Brush Killer

Chemical brush killers containing new-type ester formulations which are said to be effective on a wider variety of brush and weeds than previous formulations were, and which are less volatile than materials previously offered, have been developed by The Dow Chemical Co., Midland, Mich.

The acid equivalent content of two products, Esteron brush killer and Esteron 245, has been increased from 3.34 to 4 pounds per gallon. Both products have an improved range and effectiveness of control, the company's Agricultural Chemical Division states. The company points out that while the new formulations are less volatile, the user should exercise care in their application, especially in the control of spray drift.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 46.

Device Simplifies High-Pressure Test

A new air-operated hydraulic-pressure-generating device for static-pressure testing of boilers, piping systems, compressor cylinders, and similar pressure vessels is now manufactured by The Cooper-Bessemer Corp., Mount Vernon, Ohio. Developing up to 23,000 psi, the Cooper-Bessemer Intensifier is compact in design, weighs 80 pounds, and is mounted on a two-wheel rubber-tired undercarriage for transporting to any testing job. To operate the unit, it is connected to any compressed-air line.

The Intensifier is entirely air-operated. This feature, the company says, makes it particularly desirable for pressure testing in potentially explosive atmospheres where electric-motor-driven equipment is normally considered hazardous.

In operation, the Intensifier draws oil from its built-in supply reservoir. Variable static hydraulic pressures are preset by a turn of the Intensifier's regulator valve, equipped with a dial-

type air-pressure gage. Discharge pressures are indicated on a large direct-reading dial gage. Static pressures up to 23,000 psi can be quickly built up by using air-line pressures up to 90 psi, according to the manufacturer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 145.

New Electric Hoist

Lifting speeds up to 41 fpm, a lower as well as an upper-limit stop, and a wide pick-up angle are three of the new performance features claimed for the chain-type Load King electric hoist announced by The Yale & Towne Mfg. Co., Philadelphia 15, Pa.

Available in 500, 1,000, and 1,500-pound load capacities, the standard models lift loads through any height up to 40 feet. The link chain supports the load over an electrically driven sheave; this permits long lifting lengths since

wound-up chain does not wrap around a drum but collects in a metal container as the hook rises. The hoist hook can "reach out" as far as 30 degrees from the vertical to pick up loads, according to the company. The limit stops prevent overtravel of the hook when lifting or lowering. They operate when the hook reaches predetermined levels and break the electrical circuit to return the push-button controller from either the "up" or "down" position to "neutral".

Further information may be secured by requesting Bulletin P-1172. Or use the Request Card at page 16. Circle No. 42.

Power Tools for Machining

A 36-page 2-color catalog describing heavy-duty power tools for wood, metal, and plastic is available from the Walker-Turner Division, Kearney & Trecker Corp., Plainfield, N. J. It gives complete specifications and operating conditions for each machine: bandsaws, radial saws, and tilting arbor saws; drill presses; jointers, lathes, and shapers; air feeds, surfacers, and flexible-shaft machines.

This literature may be obtained from the company by requesting Catalog A. Or use the Request Card at page 16. Circle No. 147.

HERE'S A FASTER, EASIER, CHEAPER WAY
TO HANDLE MORE DIRT, ROCK OR GRAVEL!

OMAHA
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The OMAHA STANDARD "CENTER DUMP" Trailer . . .

... Custom Built to Job Requirements is designed for contractors who want to haul dirt, gravel, rock, long or short distances, quickly and at low cost, for stock piling, spreading or dumping. Contractors say it is just what they have been looking for!

- ★ Each unit built to job requirements.
- ★ Available in sizes and lengths to meet all bridge and axle laws.
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- ★ DOOR OPENING Meter control that can be pre-set.

Write at once for specifications and descriptive folder that will answer your questions and show how you can make every load a "profit" load. Address today—

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McCarthy MOBILE-MOUNT VERTICAL DRILL FOR BLAST HOLE DRILLING

McCarthy Vertical Drills are compactly designed for truck, half-track or caterpillar mounting. They adapt to any job where soft rock formations are to be removed, and their tough, simplified construction means bigger profits through reduced drilling costs and increased drilling speeds.

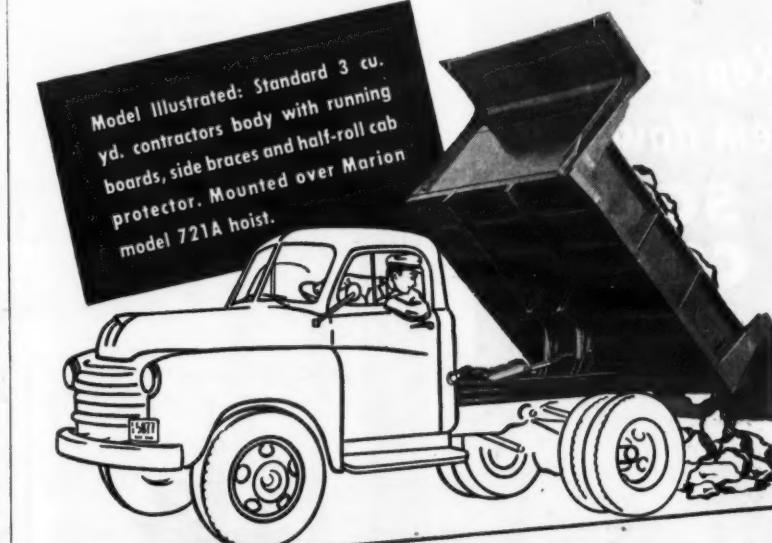
McCarthy Drills are equipped with plenty of power and finger-tip controls. They're easy to set up and easy to move about.

See your McCarthy Dealer today or write us direct for complete information. Our 48 years of experience can mean vastly increased profits for you.

Makers of
Drilling Equipment
Since 1901

THE SALEM TOOL CO.

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Stay Ahead of the Job With "On The Job" Design

It's the day-by-day performance that counts.

That's why Marion Bodies and Hoists will help you stay ahead of the job.

Every Marion unit is designed "On The Job" under actual working conditions. Faster loading and dumping . . . extra pounds on every trip . . . longer service life . . . are engineered into every Marion unit.



GET MORE DETAILS NOW

Just mail a post card or letter for the complete Marion catalog, or ask your Marion Distributor.

MARION
BODIES AND HOISTS

MARION METAL PRODUCTS CO., MARION, OHIO

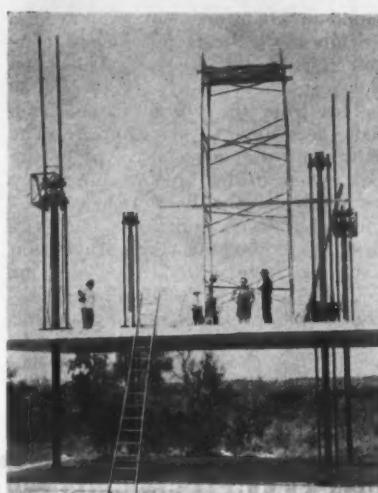
Low-Cost Technique For Campus Buildings

Construction has recently begun on the first two buildings in the new-campus program of Trinity University, San Antonio, Texas. Successful low bidder on the 44,500-square-foot classroom-administration building was James Stewart & Co., Inc., of New York City. Second low bidder on this building, G. W. Mitchell Co., of San Antonio, was given a contract to construct the first unit of the men's dormitory group.

It was announced that the Youtz-Slick lift system of construction will be used—a new low-cost building method developed by the Institute of Inventive Research, San Antonio, in which floor and roof slabs are cast without forms and raised to permanent positions by automatic power lifting equipment.

The classroom-administration building will be two stories, measuring 61 x 384 feet. It will be built on the highest point of the 107-acre new campus. Bid for this building was \$279,364—or \$6.35 per square foot. The men's dormitory unit will be located just below the bluff, facing the San Antonio skyline. This will be a Z-shaped structure containing 32 rooms, a lounge, dining room, and kitchen. It will be constructed of brick and concrete blocks.

In the Youtz-Slick method foundations are poured in place, followed by the pouring of a base slab. Columns of pipe, structural steel, or concrete are then placed, anchored, and grouted. The roof slab, or the second floor and roof slabs if the building is two-story, is laid on the base slab which is used as a bottom form, thereby requiring only edge forms. Concrete is poured directly on the base slab over a sep-



The Youtz-Slick method of building construction literally "raises the roof". Here the second-floor slab of an experimental building, poured on the base slab and lifted to position, is ready for welding to columns.

arating medium and allowed to cure for at least 7 days. Specially designed lifting equipment is placed on the columns and attached to the slab. The slab is then raised to its permanent position and welded to the column by means of a collar placed in the slab at the time of pouring.

The Youtz-Slick method was named after its originators, Philip N. Youtz, New York architect, and Tom Slick, San Antonio business man and rancher, who conceived the techniques independently of each other, and has been subjected to research and test construction for more than two years.

It is said to be adaptable to multi-

storied construction, and plans and specifications for such use are in preparation. Consultants working with the Institute include, besides Youtz, Fred N. Severud, New York consulting engineer; Alfred A. Gassner of Gassner Aircraft Engineering, New York City; and O'Neil Ford, San Antonio architect; as well as engineers of Southwest Research Institute.

The Institute of Inventive Research plans to license the method to builders. The various types of lifting equipment and their utilization to achieve economies are somewhat in the design stage, but engineers expect the plan to be available in the near future.



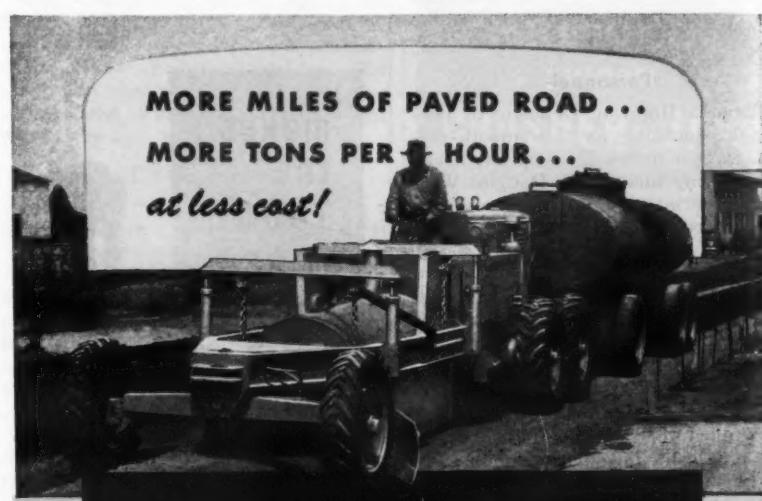
The center line of pipes can be determined with this new tool.

Pipe-Center Locator

A special tool designed to locate the center of pipes has recently been developed by Interstate Sales Co., 123 E. 18th St., New York 3, N. Y. This Model PF Pipe Fitters' Special has a revolving dial with four levels marked in both degrees and inches-per-foot.

Weighing 6 ounces, the tool is pocket-sized, measuring 6 x 4 x 1 1/4 inches overall. The frame is a magnesium casting; all other parts are brass or stainless steel. The center-punch is made of a No. 416 stainless steel.

Further information may be secured from the company. Or use Request Card at page 16. Circle No. 60.



WOOD ROADMIXER

The Wood Roadmixer is your best answer to modern low cost mix-in-place construction. Here's why:

LESS MANPOWER—this one man operated traveling mixing plant takes low cost native materials and thoroughly mixes with emulsion, road oil or soil cement binders in one pass—windrowed and ready for spreading and compaction.

HIGH PRODUCTION, LOW COST—up to 350 tons mixed per hour at less than 7 cents a ton is not uncommon.

FULL JOB CONTROL—from start to finish. You control the rate of travel, the pressure of binder, the uniform pickup of material. With measured windrow and supervision of aggregate you're assured a surface of uniform quality every time!

3 MODELS AVAILABLE

Self-propelled Models 42 and 36 and tractor-drawn Model 34. Write today for complete information and prices.

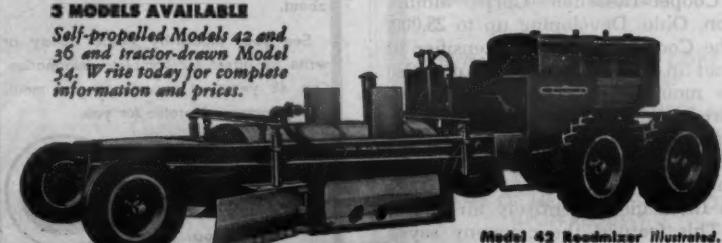
SELF PROPELLED—to and from the job speeds of 15 MPH and working speeds up to 40 ft. per minute!

MORE THOROUGH MIXING—pug mill mixing drum provides 200 mixing passes in 45 seconds! Compare this to the 1 to 4 passes provided by other mixers.

MANEUVERABLE as a motor patrol—uses pneumatic tires. Assures adequate traction in low bearing soils.

PLENTY OF ROADBUILDING APPLICATIONS—surfaces secondary roads, airfields, road shoulders, parking areas and detours. Subsurfaces major roads and airfields.

ACCEPTED AND RECOMMENDED by a majority of state highway departments, by the Civil Aeronautics Authority, U. S. Bureau of Public Roads, and the U. S. Army and Navy.



Model 42 Roadmixer illustrated.

ROADBUILDING EQUIPMENT
WOOD MANUFACTURING CO.

BOX 620 • 6900 TUJUNGA AVENUE • NORTH HOLLYWOOD, CALIF.

Kept Punching 'em down into SOLID CORAL ROCK



The W. T. Price Dredging Co. cast these 24-inch square by 60-foot long concrete piles right on the job . . . drove them with a McKiernan-Terry Double-Acting Pile Hammer. The bridge was built on NW So. River Drive, Miami, Florida.

On a bridge job in Florida, concrete piles were driven into solid coral rock . . . without faltering, without delay . . . by an 11-B-3 McKiernan-Terry Double-Acting Pile Hammer. Damage to the pile head was very slight. No special equipment was used in this unusual application.

No matter what your project, you can count on the power and dependability of McKiernan-Terry Pile Hammers. For the standard McKiernan-Terry line of five double-acting and five single-acting hammers and two double-acting extractors provide a choice to meet any driving or pulling requirements.

McKIERNAN-TERRY CORPORATION
MANUFACTURING ENGINEERS
19 PARK ROW, NEW YORK 7, N. Y.

MKT 275B

McKiernan-Terry PILE HAMMERS AND EXTRACTORS



The Hamer-Dril is an adapter $8\frac{1}{2} \times 1\frac{1}{2}$ inches in size which, when chucking in any standard $\frac{1}{4}$ -inch electric drill, converts it into an electric hammer for moderately heavy hammer action.

New Hammer Adapter Fits Into Electric Drill

Moderately heavy hammer action may be obtained from any $\frac{1}{4}$ -inch electric drill with the new Hamer-Dril adapter, says the Hamer-Dril Co., Box 158 Planetarium Station, New York 24, N. Y. Chucked into a $\frac{1}{4}$ -inch or larger drill, the Hamer-Dril strikes one blow for each revolution of the driver. The adapter may also be operated in a drill press or in a flexible-shaft driver. The force with which it strikes is "built-in" and is the same regardless of the speed or power of the driver, the company says.

The adapter is $8\frac{1}{2} \times 1\frac{1}{2}$ inches in size and weighs $2\frac{1}{2}$ pounds. The unit is adapted through two tool holders to fit all Rawl drills using No. 14 and No. 20 tapers (sizes $5/32$ to $\frac{1}{8}$ inch). It has a $9/16$ -inch hexagonal opening to make it adaptable to tools for other purposes. Chisels and tool-steel blanks are also available for use with it. The Hamer-Dril is permanently lubricated. Its integral shock absorber is designed to give ease of use and protection to the drill.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 74.

Air-Cooled Engines

Two new ultra-low-profile air-cooled industrial engines, the AC-5 developing $\frac{3}{4}$ to 1 hp and the AC-6 developing $1\frac{1}{2}$ hp, have been introduced by the Continental Motors Corp., 626 Ford Bldg., Detroit 26, Mich. Both feature a specially designed suction-type carburetor and an underslung fuel tank.

The new models are single-cylinder 4-cycle L-head engines, with a bore and stroke of $2\frac{1}{2}$ and 2 inches respectively, a displacement of 7.1 cubic inches, and a compression ratio of 5.2 to 1. The power-take-off end of the crankshaft is equipped with large-capacity ball bearings; the cranking end, with a shoulder-type replaceable bronze bearing with integral thrust face. The exhaust valve is constructed of heat and corrosion-resistant silchrome steel, seating in a special alloy-steel insert.

Standard equipment includes an oil-bath air cleaner, dustproof and moistureproof Wico flywheel-type magneto, blower housing, muffler, 1-quart fuel tank, air-vane governor, and rope starter pulley with rope and handle. A

WON'T QUIT or cause time out



A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

The Hayward Company
32-36 Dey Street
New York, N.Y.

Hayward Buckets

recoil or kick-starter assembly, remote throttle control, ignition lock, and heavy-duty 6 to 1 reduction gear, which can be mounted in any of four positions, are available as special equipment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 134.

Densifier and Retarder For Prestressed Concrete

A 4-page bulletin on the use of Plastiment, a concrete densifier and retarder, in prestressed-concrete construction has been prepared by Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J. Highlight of the bulletin is a description of the construction and testing of a prestressed girder like those designed for Philadelphia's Walnut Lane Bridge. Characteristics and test results of special plant-mixed concrete containing Plastiment are included.

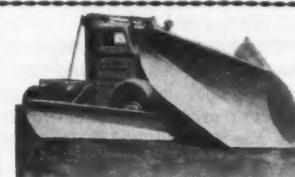
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 100.

Conveyor Assemblies

A broadside describing prefabricated conveyor assemblies has been issued by the Baughman Mfg. Co., Jerseyville, Ill. The literature points out that no attempt has been made to standardize complete conveyors; instead, the company has developed prefabricated conveyor assemblies, with standardized units from which the job-fitted conveyors may be assembled.

The folder describes the units available and lists specifications, pertinent engineering data, and applications. In addition to the long conveyors, assembled from 8, 12, and 20-foot-long sections, Baughman portable belt conveyors are also presented. Gasoline-engine or electric-motor drive are available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 13.



There's Always a BEST WAY

That goes for snow clearance, too. It's no mere accident that

DAVENPORT-FRINK SNO-PLOWS

enjoy engineer-preference throughout the snow belt. They have won their spurs through Faster • Safer • Cleaner Snow Removal.

PLAN AHEAD

The best time to think about increased efficiency for next year is NOW. We'll gladly supply complete information.

DAVENPORT BESLER CORP.

Dept. A. Made in Eastern U.S.A. by CARL H. FRINK, 1000 Islands, CLAYTON, NEW YORK

GETMAN'S New SCOOT-CRETE



There are countless applications for the GETMAN SCOOT-CRETE, the most modern, efficient and economical way of handling bulk materials. Has maneuverability with caster steering, large heavy-duty tires for traction to move a load over any surface. Built rugged for day in and day out service, and when it's time to stop, the SCOOT-CRETE has brakes that HOLD. So if you want to drastically cut cost in materials handling, go the GETMAN way—see SCOOT-CRETE today!

Getman Bros. Mfg. Div.
South Haven, Michigan



LINK-BELT Malleable Iron and Promal Elevator Buckets— Built for Rugged, Heavy-Duty Service

Link-Belt elevator buckets are long-lasting, accurate in shape and dimensions and their strong, smooth, seamless, uniform construction, assures proper filling and clean discharge. They have reinforced corners and are resistant to rust and corrosion. Available in various sizes, capacities and styles. Contact your nearest Link-Belt Office.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg, Offices, Factory Branch Stores and Distributors in Principal Cities.

IT'S THE NEW MILLER MODEL B Engineered To Give MORE PAY LOAD

NOW IN

14' or 16' LENGTHS

FEATURING

A NEW chassis developed to give steel support to extreme platform edge.



IMMEDIATE DELIVERY
OPTIONAL equipment includes: Two speed winch, electric brakes and two way tilt control. Priced extra.

The NEW Miller Model B, 10 ton is not just another trailer but a piece of equipment engineered to give you solid steel strength without non-productive steel. The all electrically welded tapered chassis features a "straight through" axle designed and built up to give solid steel support from axle to platform. Platform is 8'x14' or 16' and 33" high. Hydraulic tilt control and winch are available in all models. WRITE for booklet on our complete Tilt Top line.

RAY MILLER RESEARCH ENGINEERS

Dept. 350 727 W. Burnham St.

Milwaukee 4, Wisc.

470 FOURTH AVENUE, NEW YORK 16, N. Y.

is Information Headquarters

for contractors, highway officials and distributors wanting further details or printed matter from the manufacturers advertising in these pages. Our Reader Service Department will be glad to forward any literature or special requests you mail to us at the above address.

CONTRACTORS AND ENGINEERS MONTHLY



The Capehart Saw Gide converts a portable electric saw into a radial-arm unit.

Portable Saw Guide

The new Capehart Saw Gide will convert your portable electric saw into a precision portable radial-arm saw, according to an announcement by Packard Mfg. Corp., 113 N. Noble St., Indianapolis 2, Ind. The unit is completely portable and can be set up in a few minutes on the job wherever two supports are available. The Saw Gide rigidly clamps to a standard 2 x 8 plank. A second 2 x 10 plank with a 1 x 3 edge board serves as a work guide. The Capehart guide, the manufacturer explains, enables you to obtain cross-cuts, bevel cross-cuts, miters, bevel miters, rips, bevel rips, ploughs, rabbets, and bevel rabbets. The last three, Packard points out, may be obtained only with a proper cutting head.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 67.

New Drawing Scales

A new line of all-metal triangular and flat scales has recently been manufactured by the Cal-Pan Corp., 1111 S. Fremont Ave., Alhambra, Calif. The three basic characteristics of these white-surfaced scales are, according to the company: (1) accuracy in design, with the position of each graduation computed to 7 decimal places for an engine engraving on a master; (2) each scale is said to be an exact duplicate of its master with needle-sharp graduations in black against a white background; (3) the all-metal scale has a constant coefficient of expansion designed to assure permanent retention of accuracy.

The surfaces of the triangular scales form an inverted V which brings the fine edges of the scales right down to the paper. Both the architects' and the engineers' scales are made in 12-inch lengths. The flat scales are available in 12 and 6-inch lengths with standard scale graduations on regular 2-bevel and opposite 2-bevel bodies.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 118.

Trenching-Machine Bulletin

A new 8-page catalog describing the Model 250 Trenchliner has been offered by the Parsons Co., Box 431, Newton, Iowa. The bulletin contains photographs depicting Trenchliner features, along with schematic drawings listing in detail the dimensions of the machine.

Some of the features described are the arch-type frame, low overhead clearance, a shiftable boom to permit off-center digging within 1 1/4 inches of the outside edge of either crawler, and a reversible conveyor that power-shifts to either extreme side of the machine for controlled discharge of spoil or truck loading. The catalog explains that the Model 250 has a range of 30 digging feeds and will dig 16 to 42 inches wide and 12 1/2 feet deep. The machine is equipped with three forward traction speeds and one reverse, and it also has three bucket-line and conveyor-belt speeds.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 45.

Reflective Surfaces For Striping, Signs

Grain-size glass beads for reflective signs or striping are now being produced by Microbeads, Inc., 209 E. Aley St., Wichita 4, Kans. Microbeads are transparent, colorless, glass spheres, ranging roughly from the size of sand to that of talcum powder. They are designed to provide highly reflective areas on highway or runway striping, warning or sign markers, safety clothing or equipment, and rear warnings for truck and road equipment.

The Microbead spheres, separated from the colored background by a transparent spacer layer, act as small lenses concentrating and reflecting the light that passes through them to the

color layer. They may be sprayed or dusted on a surface while it is still in a tacky condition. The brilliance of the reflection, the company says, depends on the thickness of the spacer layer. High reflection is obtained by applying Microbeads side by side in only a single layer and by having this layer properly spaced from the painted surface. Microbeads come in a variety of sizes and grading, each for a specific application.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 50.

Kennametal News

Kennametal, Inc., Latrobe, Pa., has named John D. Cook as its representative in the north Indiana area, and

Stenzel & Co., 25 Richard Wagner St., Weisbaden, Germany, as its representative in Western Germany.

Additions have also been made to the Kennametal service personnel. William J. Bruun and Harry E. Brandvik have been appointed to the Chicago office and Edward J. Novack to the Philadelphia office.

Kennametal has transferred C. J. Marlett to its engineering department at Latrobe, Pa., where, as Project Engineer, he will work on new applications for the company's products. Mr. Marlett has been Kennametal's representative in the Chicago district for the last seven years. He is a graduate of the Armour Institute and has had 20 years of experience in the field of tool engineering.

A 14-page four-color packaged universal C-100. Built these bridge basic elements precast reported to assembled cast reinf seat, and to the building, and

HERE'S BIG VOLUME AGGREGATE Cedarapids UNITIZED

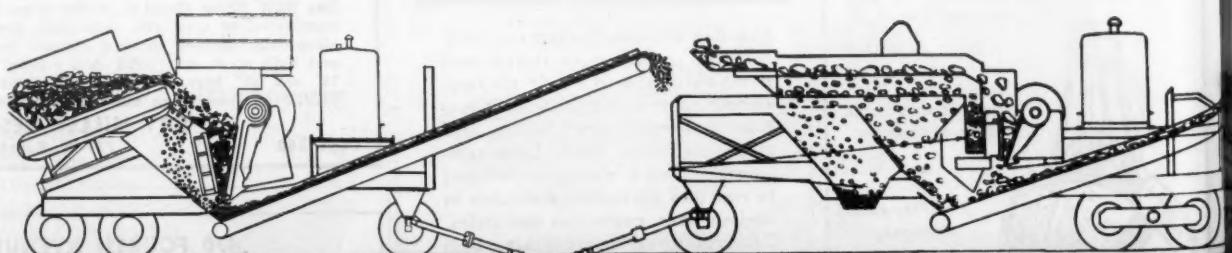
YOU get big volume production for big volume profit when you use the Cedarapids Unitized Plant! With these four flexible basic units combined in a dozen different ways, or used alone, you can meet any quarry condition, any capacity requirement from 25 to 250 tons per hour, any finished product specification from rip rap to aggregate...with big volume efficiency and economy. Write for Bulletin UNIT-2 for complete details.



FOUR BASIC UNITS MEET EVERY AGGREGATE SPECIFICATION

1 PORTABLE PRIMARY CRUSHING UNITS handle the crushing of raw material, reducing it to a size readily handled by the scalping unit or secondary. Easily moved to meet every job requirement. Available in a size to fit your needs.

2 SCALPING UNITS remove excess fines and crush the material to reduce the circulating load on the secondary. They can also be used for making specialized products and where oversize is not too large they can be used for primary crushing. Choice of sizes.



Cedarapids

BUILT BY
IOWA

THE IOWA LINE of Material Handling Equipment Includes:
ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL TRUCKS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • TIRE TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE AND GRAVEL PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • HAMMERMILLS • DRAG SCRAPER TRAILERS • WASHING PLANTS • SOIL COMPACTORS • STEEL TRUCKS AND TRAILERS • KURTZ IMPACT BREAKERS

Packaged-Bridge Design

A 14-page booklet illustrated with four-color photographs describes the packaged bridges fabricated by Universal Concrete Pipe Co., Columbus, Ohio. Bulletin PB-50 explains that these bridges are developed from three basic elements, made from reinforced precast concrete, that can be transported to a site and quickly and easily assembled into a complete bridge. The elements of this "package" are: precast reinforced concrete cribbing, bridge seat, and bridge deck slabs. According to the bulletin, three men and a power crane can construct a complete bridge in one or two days.

Building of the forms, mixing, pouring, and curing of concrete are done

under carefully controlled conditions in one of Universal's plants. The units are then delivered to the site where the bridge work gets under way with construction of the abutments from Universal cribbing. This cribbing does not require footing or piling, according to the company. It is supplied in two types, open-face and closed-face; the latter is used wherever there is a possibility that the fine materials of the porous backfill will wash out between the stretchers.

The catalog points out that 40 feet is the maximum span possible with precast bridge deck slabs as made today. However, longer bridges may be built by using center piers. The bridge slabs are designed for the H20 S16 or H15 S12 loading of the standard AASHO specifications for highway bridges.

Over twenty photographs illustrate the step-by-step procedure in erecting packaged bridges. Detailed engineering drawings show one of the possible constructions. All features and applications of the packaged bridges are presented in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 95.

District Manager Dies

C. H. Buckmaster, Detroit District Manager for The Lincoln Electric Co., died March 27 of injuries received in an automobile accident. Mr. Buckmaster had been with the Lincoln sales department for 20 years, 16 of which were spent in the Detroit area.



The Watson safety-tread ladder step gives workers stability at any rung height. Or it can serve as a platform for tools, buckets, etc.

Safety Ladder Step

Magnesium ladder steps, with cast-in safety treads to give workers stability at every rung height, are manufactured by The Watson Co., 1443 Main St., Buffalo 8, N. Y. Each step is said to fit any ladder rung and free both hands for the job. Adjustable to any safe ladder incline, the step has a non-slip platform surface of cast-in abrasive, $1\frac{1}{2} \times 7\frac{1}{2}$ inches in size. When not used as a step, it can be used as a platform for tools, paint brushes, buckets, etc.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 20.

Lightweight Drill

A special lightweight drill for use in equipment maintenance shops has been introduced by Cummins Portable Tools, Division of Cummins Business Machines Corp., 4740 Ravenswood Ave., Chicago 40, Ill. It weighs $4\frac{1}{4}$ pounds, measures $8\frac{3}{4}$ inches in overall length, and has a die-cast aluminum body. Capacity is $\frac{1}{4}$ inch in metal and $\frac{1}{2}$ inch in wood. No-load speed is 1,300 rpm.

The knob handle rotates in a slot and adjusts to the most comfortable position—a quarter-turn loosens it, then it can be tightened at the desired spot. The drill is equipped with a Jacobs Model 7B geared chuck. A ball thrust bearing is mounted on the chuck spindle, which is directly in line with the armature shaft for increased accuracy in drilling.

Further information may be secured from the company. Or use the Request Card at page 16. Circle 11.

Bottom-Dump Wagons

A 16-page catalog describing the Model FDT 13-cubic-yard 20-ton bottom-dump Euclid has recently been issued by the Euclid Road Machinery Co., Cleveland 17, Ohio. Complete specifications and all construction and operating features of this new "Euc" are included in the folder. Improved features are highlighted. They include the option of 21.00×25 or 24.00×25 drive and trailer tires, an air-assist clutch, 190 or 200-hp diesel engine, new driver seat, and a new trailer hopper designed to shed wet, sticky material.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 91.

When Salesmen Buy, It's News

It has come to our attention that J. D. Aldrich, Western Sales Manager of Rosco Mfg. Co., recently purchased the Sherman Hotel at Wolf Point, Mont., a natural stop-over from Minot, N. Dak., to Spokane, on what is called the High Line.

Perhaps the purchase indicates a surfeit of those struggles with hotel clerks, or that the dreams of salesmen are the same as those of editors and many others—to buy a little bar and grill somewhere out of the H-bomb's way and settle down.

PRODUCTION AT ITS BEST— all purpose PLANTS

MAXIMUM FLEXIBILITY

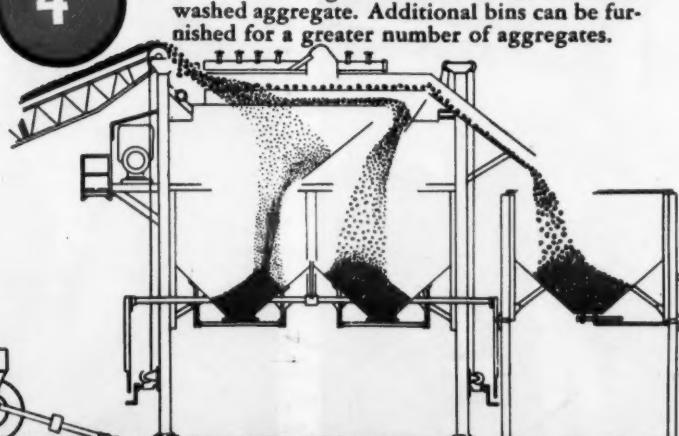
MAXIMUM PRODUCTION

MAXIMUM ECONOMY

SPECIFICATION—ANY QUANTITY REQUIREMENT

SECONDARY CRUSHING UNITS available with four types of crushers—roll, twin jaw, Symons Cone and hammermill—interchangeable to suit your finished product requirements. A complete crushing and screening plant in itself, the Secondary is the heart of the Unitized Plant. The other matched units can be added later.

WET OR DRY SCREENING UNITS consist of a 2-compartment bin and double-deck screen. Washing attachments can be added for washed aggregate. Additional bins can be furnished for a greater number of aggregates.



IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.



C. & E. M. Photo

The new 60 x 430-foot building of the New Hampshire Highway Garage fronts on Stickney Avenue, just east of the Boston & Maine Railroad tracks, in Concord.



N. H. State Highway Department Photo

In back of the new building (left) is the original 50 x 360-foot garage which has been reconstructed. A 35 x 119-foot wing (center) connects the two buildings, old and new.



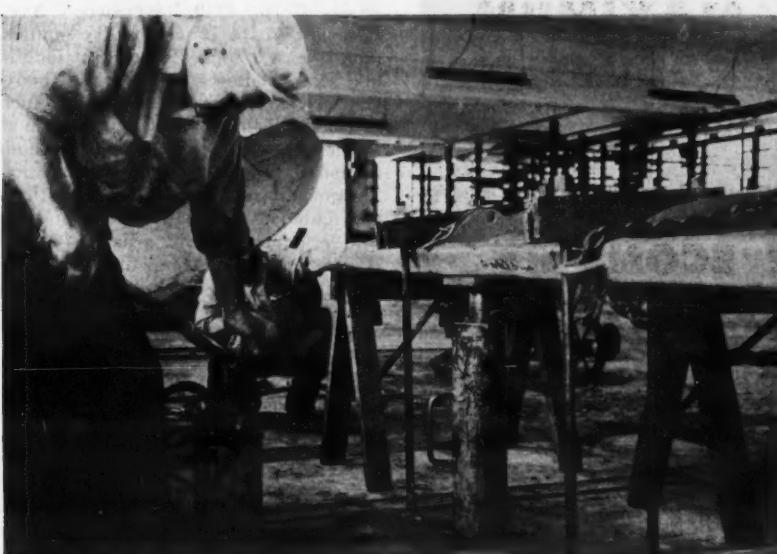
N. H. State Highway Department Photo

A "straightening floor" was built into the new garage. Framed in the concrete are steel slots formed with heavy angle irons welded to and supported on a steel I-beam grillage. The entire framework is firmly anchored in reinforced concrete.



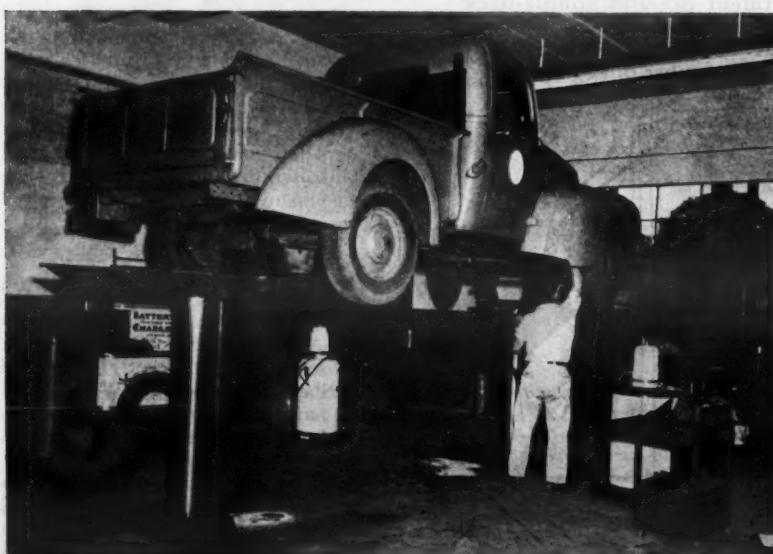
C. & E. M. Photo

Earl Sawyer, Equipment Engineer, heads the various departments of the garage.



N. H. State Highway Department Photo

Here a bent truck frame is fastened to the straightening floor with vertical rods that slide in the slots, and pressure is exerted on it by Rodgers hydraulic jacks. This jacking equipment can exert up to 500 tons pressure.



C. & E. M. Photo

In the light-vehicle shop of the garage, a pick-up truck on a Joyce lift gets a greasing with an Alemite 100-pound high-pressure lube gun.

N. H. Highway Garage Builds New Quarters

New 60 x 430-Foot Building Has Fluorescent Lights and Radiant Heat; Old Shop Is Also Modernized

THE New Hampshire Highway Garage, a subdivision of the State Highway Department, is now functioning in one of the most modern plant layouts for highway shops in the country. A new 60 x 430-foot building, with such features as fluorescent lights and radiant heat, was completed in March, 1949. And the existing 50 x 360-foot garage has been reconstructed to conform with this up-to-date design. Alterations to the latter were finished last June. The two structures lie parallel, and are connected at the center of their long sides with a 35 x 119-foot wing. The new building fronts on Stickney Avenue, just east of the Boston & Maine Railroad tracks, in Concord, New Hampshire's state capital.

All the construction at the garage was done by the Keyser Construction Co. of Manchester, N. H., work getting under way in October, 1947. The new building cost \$296,000, while alterations to the existing structure were around \$61,000. The combined plant now has over 55,000 square feet of floor space. There is a second floor over the middle third of the new building; the remainder of both structures is single-story. The connecting wing, part old and part new construction, is a stockroom with service windows at the ends opening into both buildings.

Not a single inside column or post mars the interior sweep of the new garage. It was built like a rigid-frame bridge with the slightly arched concrete roof slab cantilevered between two rows of reinforced-concrete columns on 20-foot centers down the sides of the building. Large steel-sash windows

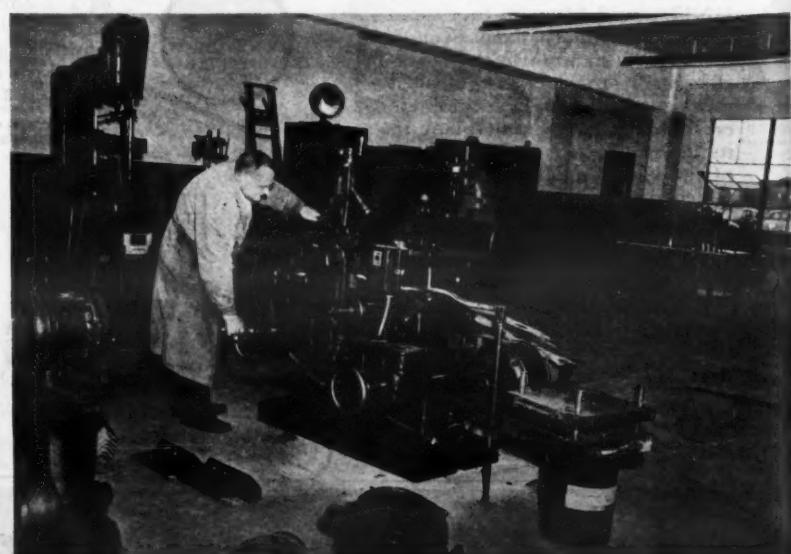
framed in brick facing, occupy most of the space between columns. Inside, the 8-inch brick walls are covered with a $\frac{3}{4}$ -inch coat of soft plaster.

Radiant Heat

Radiant heating has been installed throughout the garage within the floor slabs. Welded pipes for carrying the hot water are embedded in a 6-inch concrete slab that is laid on a 2-inch mat of Mascrete. The 6-inch concrete roof slab of the new building is also covered with a 2-inch insulating course of Mascrete, and then topped with tar-composition roofing material. The insulation serves to retain the building heat. The two hot-water boilers heating the garage are fired by No. 5 fuel oil; water temperature is held around 140 degrees F.

While the large windows bring plenty of natural light into the building, five rows of fluorescent lights run the length of the garage ceiling. In the general offices on the second floor of the new wing, the fluorescent lights are recessed

(Continued on next page)



C. & E. M. Photo

In the machine shop south of the center entrance of the garage, a snow-plow push frame is shaped on a Gould & Eberhardt 16-inch-stroke High Unity shaper.

in the ceiling to serve as a light fixture.

Equipment is stored through doors in the rear of the building. The doors are the same height as the windows, but two are high enough to clear the large snow-plow frames by a few inches.

An unheated storage pair is a separate building built into the rear of the structure. It has windows on the side and a door on the end.

Frames are built in pairs, one pair being a pair of beams.

Below the frame is a forced air system, and beams are supported by rods that are straightened by jacking.

The garage is a large, single-story building with a high roof and a long span. It has a central entrance and several side entrances. The exterior walls are made of brick, and the roof is made of concrete. The interior of the garage is divided into several bays by columns. The floor is made of concrete, and there are several large windows on the side walls.

in the ceiling. Pressed-steel channels serve as uprights which contain slots into which Transite partition panels are set. The size and shape of the individual offices may thus be changed readily and simply. Office floors are covered with asphalt tile, and the ceilings with acoustical tile.

Equipment is admitted to the garage through electrically operated roller doors in the sides of the building away from the street front. Most of the doors are the standard 10-foot 6-inch width, but two of them are king-size, 12 feet high x 14 feet wide, to accommodate the larger machines. Snow, ice, or debris that may be brought into the garage by the equipment is disposed of in floor drains which are flushed out with water at 85-pound pressure.

Straightening Floor

An unusual feature of equipment repair is a "straightening floor" that was built into the garage. With this device a structural member may be straightened out or bent to any desired shape or angle by means of hydraulic pressure without recourse to heating the member. Straightening truck frames, snow plows, or grader blades is probably the major work of this tool. It occupies a 15 x 80-foot area of the floor in the welding and fabricating section of the shop.

Framed in the concrete floor are a series of steel slots, each formed with a pair of heavy angle irons, welded to and supported on a grillage of steel I-beams. The beam bottoms are 30 inches below the shop floor, and the entire framework is firmly anchored in reinforced concrete. When a structural member needs straightening, for instance, it is placed on a hydraulic jack, and battened to the floor with vertical rods that slide in the slots. Horses may support the rest of the piece being straightened. Pressures up to 500 tons are then exerted through the Rodgers jacking equipment on the bent portion of the member until it is completely straightened.

Garage History

The New Hampshire Highway Garage goes back to 1918 when this unit of the Highway Department was set up to maintain some surplus War Department equipment that had been obtained after the first World War. Personnel consisted of a foreman and four mechanics who used two floors of an old



In the carpenter shop of the New Hampshire garage (above), a board is placed on a Sidney 24-inch single-surface planer. At right, in the machine shop, die heads are made on a South Bend lathe with an 18-inch swing and a 12-foot bed.

C. & E. M. Photos

livery stable as a "garage". Very little highway equipment was added to the original grant from the Government, but by 1923, snow plowing to keep the main roads open in winter was recognized as an essential function of the

Highway Department. Plows were purchased, along with trucks, road graders, rollers, passenger cars, etc. Garage personnel also increased to include a superintendent, foreman, and 20 mechanical workers.

In 1925 a new brick and concrete garage, 50 x 360 feet, was built. The various phases of mechanical work were departmentalized, with each department headed by a foreman who was

(Continued on next page)



ALL OVER THE CONTINENT RECORD-BREAKING DEMAND FOR THE NEW SEAMAN MIXER

TO CUT ROAD BUILDING COSTS . . .
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Since the announcement of the NEW 1950 SEAMAN MIXERS, the demand is probably greater than has ever before existed for any road mixing equipment.

Contractors, highway engineers, states, counties and municipalities have found in the NEW SEAMAN Self-Propelled MIXER and the NEW SEAMAN Self-Propelled TRAV-L-PLANT such great versatility in forward mixing speeds that they match every condition and every material with top efficiency in performance. Greater output . . . greater mixing depths, and an unsurpassed quality of mix.

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7 forward mixing speeds, road gear
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line powered.



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N. H. Highway Garage Builds New Quarters

(Continued from preceding page)

responsible to a general foreman and superintendent. In 1937 a 60 x 200-foot warehouse was added in which is stored about \$125,000 worth of highway material, purchased in carload lots to effect a savings. These items include salt, calcium chloride, reinforcing steel, paints, lumber, etc. A metal paint shop was also constructed to handle the increasing amount of work.

Many other state departments were sending part of their work to the Highway Garage by now. In 1947 the Garage returned to the general fund of the Highway Department \$611,000 derived from rentals of equipment and services to the State Travel Bureau, State Police, Fish and Game, Forestry, and various other state departments and institutions. This was all besides the work done on the Highway Department's own equipment.

With all this work being handled, new and enlarged quarters for the garage were a pressing necessity. Accordingly the new building was added, and the existing garage was altered. While highway equipment maintenance is the prime function of the garage, the building also houses the highway laboratory for testing materials and the highway planning survey department. The survey department has offices on the second floor of the new wing where the garage administrative offices are also located.

New Building

To the right, or north side, of the center entrance to the new building is

the 60-foot square passenger-car department headed by a foreman with 7 mechanics and 2 helpers. They perform the mechanical services required not only for highway department passenger cars but for many other departments as well. The rest of this wing to the north, 60 x 140 feet, is used for passenger-car storage. Greasing, washing, and battery charging are also looked after here. Cars are greased on two lifts—Joyce and Walker—with Alemite equipment, 100-pound high-pressure lube guns. Batteries are renewed on Blitz chargers. Each of the shop departments has its own air compressor where it is required.

A list of other equipment assigned to the passenger car shop follows:

Weaver 4-ton floor jacks (2)
Canton 2½-ton hand crane
Champion spark-plug tester
Alemite portable oil drain
Air scales
Bear wheel balancer and aligners
Weidenhoff generator tester
Black & Decker ½-inch valve resealer
Atlas arbor press
Weidenhoff armature undercutter
Black & Decker 8-inch bench grinder
Brake-relining machine
Hydraulic tire remover
Globe tire-changing machine
Vulmaster electric vulcanizer
Chain falls, 1-ton

Machine Shop

To the left or south of the center entrance is the 60 x 60-foot machine shop headed by a master machinist with three mechanics. This shop turns out parts that are not obtainable in a reasonable length of time elsewhere, and such specialized work as dies used in the state prison. Repairs and replacements for some of the intricate machinery employed in other state departments are handled here. Equipment includes adequate automotive machinery as well as job machinery. A complete listing is as follows:

Kwik-Way valve facing machine
Gould & Eberhardt 16-inch-stroke High Unity shaper
Bench-type hammers
Delta bench drill
South Bend lathe, 18-inch swing, 12-foot bed
South Bend lathe, 9-inch swing, 3-foot bed
Atlas double-head bench grinder
Van Norman duplex milling machine
Bridgeport drilling attachments
Candy 20-inch drill press
Radial drill, 3-inch
Tom Thumb threading machine
Peerless 6 x 6 power hack saw
Crawford pedestal grinder
Lemco Du-all machine
Greenfield cutter grinder
Drill grinder
Reed lathe, 12-inch swing, 4-foot bed
Lemco head grinder
Kalamazoo metal band saw
K & W electric metal applicator
Bridgeport vertical grinder
Avey drilling machine

Next to the machine shop on the south side is the woodworking department or carpenter shop, also a 60-foot-square room, where a foreman and a 3-man crew repair cabs and bodies of motor vehicles; maintain office furniture and equipment; and make highway signs. Here also are constructed the sheet-metal field offices used by engineers and inspectors on highway projects. Shop equipment includes these pieces:

Yale ½-ton chain fall
Black & Decker ½-inch portable drill
Grindstone
DeWalt combination saw
National saw bench
American stake saw
Crescent 16-inch, joiner
Delta 4-inch lathe
Walker-Turner saw bench
Walker-Turner 6-inch joiner
Crescent 32-inch band saw
Sidney 24-inch single-surface planer
Walker-Turner 6-inch bench grinder
Thor portable belt sander
Black & Decker electric hammer

Adjoining the carpenter shop is the paint department, 40 x 60 feet, headed by a foreman with two helpers who handle both equipment painting and building maintenance painting. Their equipment includes:

De Vilbiss portable electric compressor
De Vilbiss portable gas compressor
De Vilbiss 2-gallon spray tanks (2)
Hypersure Jenny steam cleaner
Kerrick steam cleaner
Walker 2-ton floor jack
Large glass-grinding machine
Yale ½-ton chain falls
Black & Decker disk sander

The remaining 40 x 60-foot area at the southern end of the new building houses the state highway laboratory.

(Concluded on next page)

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MULTI-RIB
REINFORCING BARS

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Standard Sizes of New A.S.T.M.
Serial Designation
A305-49 Table I



Thanks to A. S. T. M. specification A305-49, designers now have a more efficient bar for concrete reinforcement... one that provides increased anchorage which when properly used will give appreciable savings in steel and concrete. Advanced design Laclede Multi-Rib Reinforcing Bars exceed the A305-49 specification. They are available in uniform round sections in all standard sizes and can now be ordered by number.

TABLE I A.S.T.M. SERIAL DESIGNATION A305-49

Dimensional Requirements for Deformed Steel Bars for Concrete Reinforcement

Bar No.	Unit Wt. Lbs./Ft.	NOMINAL DIMENSIONS ROUND SECTIONS			REQUIREMENTS OF DEFORMATIONS		
		Diameter-Inches Decimal	Cross Sectional Area Sq. Inches	Perimeter	Max. Avg. Spacing Inches	Min. Height Inches	Max. Gap Inches
3	0.376	.375	0.11	1.178	0.262	0.015	0.143
4	0.666	.500	0.20	1.571	0.350	0.020	0.191
5	1.043	.625	0.31	1.963	0.437	0.028	0.239
6	1.502	.750	0.44	2.356	0.525	0.038	0.286
7	2.044	.875	0.60	2.749	0.612	0.044	0.334
8	2.670	1.000	0.79	3.142	0.700	0.050	0.383
9*	3.400	1.128	1.00	3.544	0.790	0.056	0.431
10*	4.303	1.270	1.27	3.990	0.889	0.064	0.487
11*	5.313	1.410	1.56	4.430	0.987	0.071	0.540

*These sections have the same weight and area as bars formerly known as 1" Sq., 1½" Sq. and 1¾" Sq.

**Chord of 12½% of Nom. Perimeter.

*Bar numbers are based on number of ½" included in the nominal diameter of the bar section.

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• Recirculating cement system — fills sealed cement compartment (right), and then automatically switches to loading of storage tank.

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Original Building

The original wing, 360 x 50 feet, is divided about in half with the welding department occupying the northern end, and the heavy-equipment department at the south end. Welding-department personnel includes a foreman, 6 welders, and 5 helpers who service and repair department-owned plows, bodies, wings, frames, and cabs. Outside welding, sheet metal, and heavy structural work for other departments is handled by this shop.

Welding equipment includes the following:

Fairbanks portable scale
Blacksmith forge
Champion trip hammer
Hammond grinder
Rogers 100-ton press
Buffalo punch and shear
Oxwell cutting machine
Wilson 300-amp welders (2)
Marquette 275-amp arc welder
Marquette 250-amp arc welder
Hosfield 10-ton welder
Yale 1½-ton chain falls
Wright 1-ton chain falls
Ingersoll-Rand chipping hammers
Ingersoll-Rand riveting hammers
Walker 10-ton floor jack

The heavy-equipment department, headed by a foreman with 10 mechanics and 5 helpers, services and repairs the Department's 76 heavy trucks, 5 power shovels, 25 motor graders, 10 rollers, and other heavy equipment. Some cities and towns also have their equipment serviced here when it can not be done elsewhere.

Equipment in this shop includes the following:

Curtis air compressor
Pneumatic tire changer
Breeze brake-relining machine
Swick-Way bench grinder
Champion spark-plug tester
Air scale
Jack, 10-ton floor
Canedy-Otto portable crane
Chain falls, 1-ton, 1½-ton, 2-ton
Walker unit lift
Firestone Hydro-Flator

At one end of the original wing there is storage room for several carloads of steel members which are cut and shaped in the garage. About 300 tons are used every year.

Other Departments

The stockroom between the new and old wings of the garage measures 119 x 35 feet. This unit is headed by a chief clerk who has three assistants. They obtain the replacement parts and materials necessary for the various departments in the garage, and standardize in such quantities as may be obtained economically. A perpetual inventory of all material is also maintained. The stock averages around \$35,000 in value.

The accounting division located in the office on the second floor consists of an accountant and seven girls who handle the cost keeping, account invoicing, and other phases of paper work.

The transportation department is headed by a foreman with a crew of ten consisting of truck drivers, riggers, and machine operators. They transport all the concrete pipe manufactured at the state prison and used on the highways. They move heavy equipment, buildings, structural steel, and other materials connected with highway construction and maintenance. This department also handles a major portion of the emergency snow plowing. Operation of the storage warehouse comes under this unit.

All of the departments outlined are headed by an administrator, Earl Saw-

yer, whose title is Equipment Engineer, with headquarters in the second-floor offices. His duties include the supervision of these various departments together with the supplies, materials, and equipment that they use. Garage personnel averages around 75 employees.

Equipment Purchasing

In 1945 an analysis was made of all garage equipment. This helped to determine what new equipment would be added in the next five years. At that time every machine was tabulated with such information as age, efficiency, cost, location, and in what year the piece of equipment could be replaced most economically. Schedules were set up accordingly, so that by 1950 the Department's equipment would be entirely renewed. Only 20 per cent of the equipment would then be five years old.

With the equipment data and schedule set-ups, costs were determined and expenditures for new investments were controlled. For when a piece of equipment was on the list for replacement, money was not expended for service prior to the replacement.

When new equipment was to be purchased the first thought concerned the

number of hours per year the unit would operate. When this was determined approximately, purchase specifications were written based on the Highway Department's experience with the numerous makes in operation. Recommendations were considered from all personnel who come in contact with that type of equipment. This included the operators of the machine, men who service the equipment, mechanic's foreman, and whoever could contribute to the cost and performance records of the units.

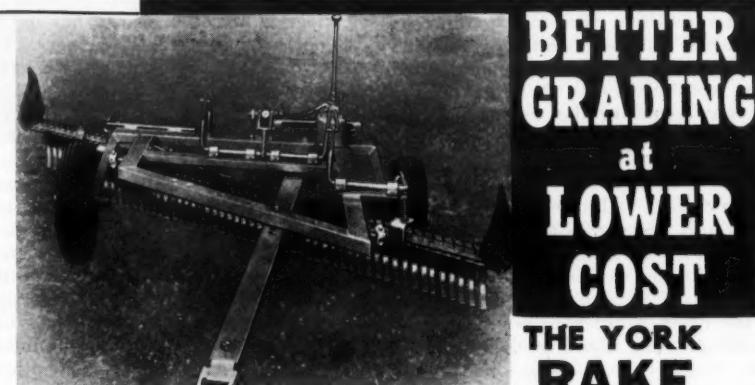
Specifications were then sent to the state purchasing agent for competitive bids. When the equipment was received, an hourly rate was established for rental in accordance with the predetermined number of hours the piece was expected to be used, together with such aggregate costs as operating, field and shop repairs, insurance, and depreciation. Although the Highway Department pays for the use of its equipment, the garage operates without profit on its personnel or materials. It is primarily a service organization, expending its knowledge for the use of any state department or institution requesting such service.

Combination Welder And 3-Kw Power Plant

A new engine-driven combination ac arc welder and 3-kw power plant has been announced by the Miller Electric Mfg. Co., of Appleton, Wis. This unit is available either as a stationary model designated AEA-200-L or a portable unit on a rubber-tired truck, the Model AEA-200-L-P.

For welding, the unit will handle ac or ac-dc electrodes from 1/16 to 3/16 inch inclusive and will deliver 200 amperes. The ac generator is built for the high-duty cycle of operation required in pipe thawing. For power, the machine provides 3-kw 110/220-volt 60-cycle single-phase current. A conveniently located switch enables the operator to change from welding generator to power plant to run lights, motors, and electric tools when no power lines are available. The generator is powered by an Onan 2-cylinder 4-cycle air-cooled engine.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 146.



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LOWER
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THE YORK
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ALTHOUGH originally designed for road maintenance operations, the YORK RAKE has proved to be ideally suited for a variety of contractor's requirements.

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It works equally well on level ground or slopes, and is especially useful in preparing ground for landscaping and roadside improvements. It does a complete job . . . breaks up and levels the surface . . . rakes the oversize stones into a windrow for easy handling . . . leaves the ground ready for seeding.

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EASY MANEUVERABILITY! Balanced. Turns, pivots in own length.

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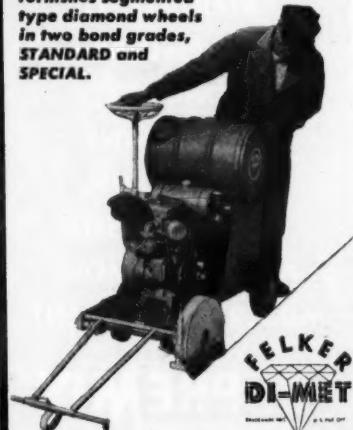
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ROETH CONCRETE VIBRATOR**MOUNTED ON WHEELBARROW CHASSIS**

Model 1—6 hp., 6000-7500 rpm
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Complete unit consists of engine mounted on wheelbarrow chassis, 21 feet of flexible shafting (three 7-foot sections) and vibrator head 2' x 22", 2½" x 16" or 3" x 16". Write for circular.

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County Constructs Causeway to Beach

Hydraulic Fill Embankment And Two Bridges Form 1.67-Mile Causeway Across Harbor On Florida West Coast

PINELLAS COUNTY, on the west coast of Florida, is constructing a 1.67-mile causeway from the mainland just south of Clearwater, the county seat, across Clearwater Harbor to Belleair Beach on Sand Key, a long island forming a part of the Pinellas County gulf beaches. The causeway includes two bridges, 1,375 and 325 feet long, and a hydraulic fill embankment for the remaining 1.35 miles. Work on the project got under way in February, 1949, and is scheduled for completion late this year.

The principal contract for \$1,011,038.60 went to W. H. Armston Co., Inc., of Dunedin, Fla., and includes the hydraulic fill, two reinforced-concrete trestle bent bridges, a double-leaf bascule span, and connecting roads. Under this contract the dredging for the roadway embankment was done by Captain R. M. Brown of Tampa, Fla., with his 15-inch diesel-powered dredge Clearwater. The bascule span at the center of the main bridge was subcontracted to William J. Howard, Inc., of Chicago, Ill., and fabricated and erected by the Nashville Bridge Co. of Nashville, Tenn.

The new causeway will be a boon to those driving to Belleair Beach or the Indian Rocks section of the long coastal island that extends from Little Pass inlet, opposite Clearwater, 14 miles south to the entrance of Tampa Bay. The only bridge serving the north portion of the island is an old timber structure, with steel swing draw, near Indian Rocks. It was constructed in 1915. Thus to reach Belleair Beach from Clearwater it is necessary to make a U-shaped loop south on the mainland to the antiquated wooden span, and then continue north 3 miles on the narrow island to the vicinity of the beach.

New Causeway

The eastern end of the new causeway runs into an extension of the main street in Largo, a town south of Clearwater. At the western end it stops at the Gulf of Mexico, with connections to the north-south road on the island. At present this island road has a narrow, rough-riding, black-top surface, but when the causeway is completed the County of Pinellas expects to widen and reconstruct it into a modern highway. Cities on the mainland, such as Clearwater to the north and St. Petersburg to the south of the causeway, are scheduled to improve their streets and roads leading to the eastern end of the improvement.

Designed by the State Road Department and built to its specifications, the combined fill and bridge construction has a short section of embankment off



C. & E. M. Photo
The pile-casting yard on the beach end of the Pinellas County Causeway—a Rex 2-yard Moto-Mixer discharges concrete to buggies which are wheeled to pile-forms.

the island at its western terminus. Then comes the shorter 325-foot bridge, which is a relief structure, followed by a hydraulic fill section over 2,000 feet long. This brings us up to the 1,375-foot bridge which contains a double-leaf trunnion bascule span over the Florida west-coast portion of the Intra-coastal Waterway. Another fill section, 1,600 feet long, extends from the east end of the long bridge to the harbor bank on the mainland. At present, the connecting street in Largo has only a 16-foot asphalt-block pavement. The water crossing of the causeway is about 5,500 feet long.

The plans call for sufficient material to be dredged from the harbor bottom to make a hydraulic fill that extends 106 feet each side of the causeway center line to the water's edge at low tide. This 212-foot-wide embankment carries a 20-foot pavement. A 500-foot right-of-way was acquired for the causeway. Clearwater Harbor averages about 7 feet in depth, but will be improved by the construction of the Intra-coastal Canal to a navigable depth of 9 feet.

Reinforced-Concrete Trestles

The reinforced-concrete trestles comprising the bridges consist chiefly of 4-pile bents, mostly on 36-foot spans. Piles are 18 inches square, and range in length from 32 to 62 feet. They extend 1 foot into caps which are 2 feet 6 inches deep x 2 feet 8 inches wide. Across these go the deck girder spans having a 7-inch slab. The superstructure has a 24-foot clear roadway and

two 3-foot sidewalks; loading design is H15-44. For greater rigidity a tower bent of 7 piles was driven on each half of the longer bridge. Abutments also

(Continued on next page)

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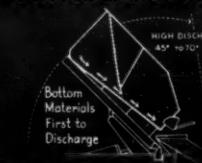
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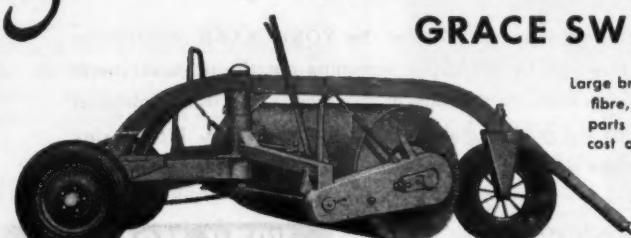
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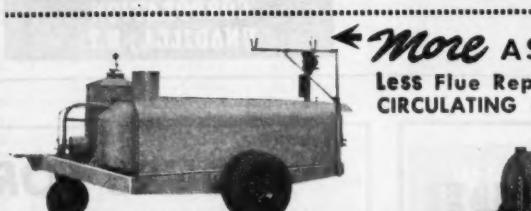
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CIRCULATING HEATER for Tank Cars

W. E. GRACE MFG. COMPANY
6003 Lamar Street
Dallas, Texas



Captain Robert M. Brown stands by the General Motors main diesel engine. In the right foreground a section of the dredge pump is visible.

contain 7 piles.

The smaller bridge has 9 spans averaging 36 feet, while the larger structure is symmetrical about a 109-foot bascule span at the center. On each side is a 40-foot steel girder span with a 7-inch concrete deck, followed by 16 other concrete spans of 36 feet reaching back to the two abutments. The bascule has an 80-foot minimum horizontal clearance at right angles to the canal, and rests on concrete piers supported on 12-inch 53-pound steel H-beams driven to rock. The piles are designed for a 45-ton load and extend through a concrete seal 6 feet thick measuring 33 x 21½ feet, which goes down to minus 18.0 elevation MSL. The 2-column piers measure 43 feet 10 inches in height.

Concrete piles were poured in wooden

forms set up in a casting yard on the island near the west end of the project. Ready-mix concrete was supplied by General Ready-Mixed Concrete, Inc., of Clearwater in a fleet of 5 truck-mixers which traveled 10.3 miles from plant to job. Darex was used in the mix to give the concrete an average air content of 4½ per cent. The truck-mixers discharged the concrete into buggies which were wheeled to the pile forms.

Driving was done with floating equipment by the Bay Dredging & Construction Co. of Tampa, building the small bridge first and then the larger. As the total of 194 piles were cast and driven, the caps and superstructure were constructed by the prime contractor using a floating concrete plant set up on a barge.

Dredging

In constructing the hydraulic fill embankment, the dredge Clearwater obtained excellent material from the harbor bottom—a mixture of about 40 per cent shell and 60 per cent sand. All the borrow excavation was taken at least 500 feet from the causeway center line over an area 750 feet wide x 4,500 feet long. The total discharge line averaged around 1,500 feet, with the landline portion set up on cribbing down the center line of the causeway. Shore pipe came in 16-foot lengths with telescoping joints. The final 20 lengths were known as pocket pipe because of 4 x 8-inch openings, 8 feet apart, along the invert of the pipe. As the material flowed from these pockets, the embankment was built up over an extended section rather than in just one place at the discharge end of the pipe. Less pipe handling was needed with these cut-out sections.

Baffle boards were also placed out along the sides to retain the fill which built up on 20 to 1 slope lines. When the embankment was well up above the water line with several feet of fill showing, a dragline worked along the crown throwing up retaining dikes at the sides. The dredge then pumped additional material within the diked area until the roadway grade was reached. At approaches to both bridges side slopes became 4 to 1, converging into 20 to 1 before reaching a mean sea level elevation.

Dredging started at a point marking the east abutment of the main bridge, and the embankment was built up back to the mainland at the rate of 7,000 to 8,000 cubic yards a day. Work was carried on 24 hours a day. The other sections of fill followed in order. The upper 12 inches of roadway subgrade

was stabilized by selection of materials to meet a bearing requirement of 40 pounds to the square inch. Then a base course 20 feet wide was built of washed oyster shells, spread and compacted in two courses and having a total thickness of 8 inches. This was topped with a bituminous road-mix surface course,

(Concluded on next page)

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66	1¾"	1.90
7	2½"	1.90
8	3"	2.50
9	3½"	2.50
10	3½"	2.50
11	3½"	2.75
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12	4"	3.00
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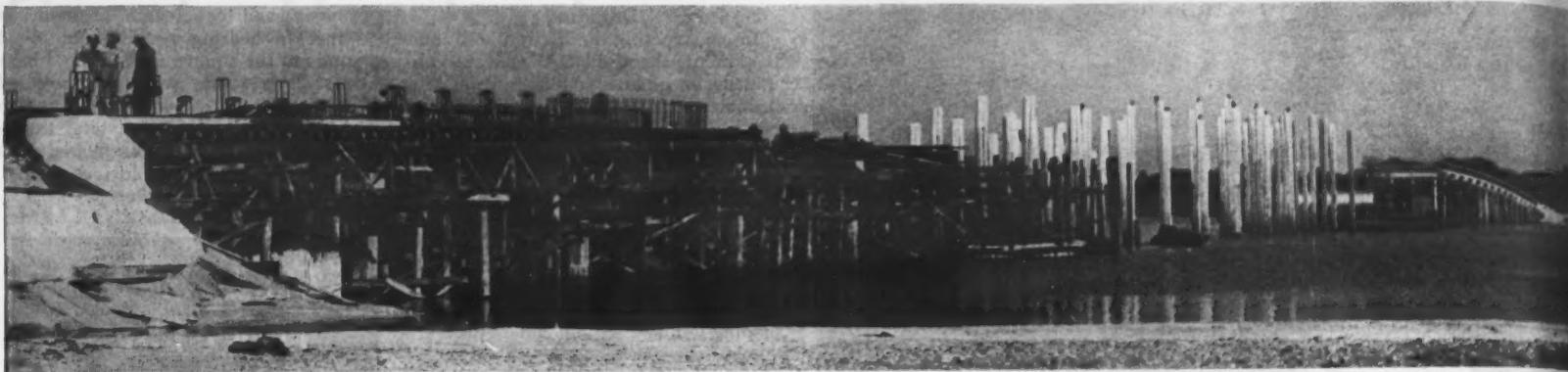
The new Murex catalog of mild steel arc welding electrodes presents complete data on performance, mechanical properties and recommended procedures for the seven mild steel electrodes in the Murex line. You'll find it useful in selecting the right mild steel rod. Write for your copy today!

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The main bridge of the causeway is 1,375 feet long and contains a double-leaf trunnion bascule span. Reinforced-concrete trestles consist chiefly of 4-pile bents.

County Constructs Causeway to Beach

(Continued from preceding page)

1½ inches thick and 20 feet wide. The pavement is flanked by 8-foot shoulders of 6-inch stabilized material on a 20 to 1 slope.

The Dredge Clearwater

The dredge Clearwater was built by its present owner in Tampa, Fla., in 1929, was rebuilt in 1938, and in 1948 was given a new power plant. It has a wooden hull 115 x 26 x 6 feet deep. At the bow is a 15-ton, 45-foot ladder supported by a 30-foot A-frame. On this job dredging was done to a 20-foot depth before rock was reached. At the stern in wells outside the hull are two spuds of steel shell, 21 inches in diameter x 45 feet long. The starboard or digging spud weighs 7 tons, while the port spud, which steps the dredge ahead, weighs 5 tons.

Amidships, and 2 feet to starboard of the dredge center line, is the main engine—a General Motors 12-cylinder 900-hp diesel with a maximum speed of 720 rpm. Immediately ahead, and consequently also off center, is a Georgia Iron Works dredge pump operating on a direct drive from the main engine through a Kingsbury thrust bearing. Forward and more to port, as a counterbalance, is a Fairbanks-Morse 8-cylinder 300-hp diesel that drives a Westinghouse 240-kw generator supplying power for the cutterhead motor, swing motor, electric pumps, and ship lighting. A Hercules 115-hp diesel is hooked up with a 75-kw generator as an auxiliary.

A Westinghouse 75-hp motor turning at 600 rpm operates a 6-blade 48-inch basket-type cutterhead at 21 rpm through a gear-reduction box. Behind the cutter a 16-inch intake pipe goes up the ladder and into the dredge through an 8-foot-long rubber sleeve where it meets the hull. The pipe veers slightly off the dredge center line to enter the main pump which has 4 vanes and a 42-inch impeller.

The 15-inch discharge line leaves the bottom of the pump on the starboard side and continues back to the stern inside the deckhouse. In the lever or control room, gages show that the pump produces an 8-inch vacuum when pumping only water, and a 25-inch vacuum when under a load of material. Discharge pressure averages 40 pounds.

Swing Operations

Forward near the bow is a 5-drum Cyrus-Erie swing gear powered by a Westinghouse 50-hp motor. The drums are laid out in two banks, with the two spud and ladder drums at the rear and the swing drums to the front. On its ½-inch cable the Clearwater has a swinging range of 160 feet, but on this job kept its lateral movement down to 125 feet. Two anchors weighing 2,000 and 3,500 pounds, out to the sides, hold the dredge on the swing arc.

The floating line leaves the stern of the dredge through rubber sleeves, and thereafter each section of 50-foot pipe, 15 inches in diameter, is supported on two pontoons, one at each end. The

floats are metal cylinders, 16 feet long x 3 feet in diameter.

Auxiliary floating equipment includes the Florida, a 47-foot tug powered by a GM 165-hp diesel engine, and two launches—the 36-foot Punkey driven by another GM 165-hp diesel, and the Gone, a 27-footer equipped with a Chrysler marine gas engine. Anchors and heavy equipment are handled by an 18 x 36-foot derrick barge which has a 30-foot boom actuated by a gas engine.

In her tanks the Clearwater carries 3,800 gallons of diesel fuel, a 3-day supply, which is replenished from a 20 x 60-foot fuel barge which holds 9,000 gallons of oil supplied by Sinclair from Tampa. A 16 x 24-foot barge holds 1,200 gallons of water obtained ashore for the use of the dredge.

Captain Robert M. Brown, owner of the Clearwater, supervised the dredging operations, using a total force of 30 men on the project, including the shore crew on pipe and three shifts on the dredge.

Quantities and Personnel

The principal items in this major contract for the construction of the Belleair Beach bridges and causeway include the following:

Hydraulic embankment	350,000 cu. yds.
Stabilizing fill, roadbed 12-inch	18,385 sq. yds.
Stabilizing fill, shoulders 6-inch	12,737 sq. yds.
Shell base, 8-inch	16,813 sq. yds.
Bituminous surface	16,813 sq. yds.
Concrete piling, 18-inch	8,400 lin. ft.
Concrete bent spans	3,384 cu. yds.
Concrete seal	352 cu. yds.
Reinforcing steel	582,720 lbs.
Steel H-piling	2,800 lin. ft.

For the W. H. Armston Co., Inc., of Dunedin, Fla., the prime contractor Sam Davis is General Superintendent, and Bill Lovelesce is Superintendent on the bridge work.

Norman M. Hopkins is Project Engineer in charge of the work for Pinellas County and the state of Florida. E. H. Beckett was Chairman of the Board of County Commissioners of Pinellas County when the contract was let, and W. A. McMullen, Jr., is County Engineer.

Hercules Moves in Houston

The Houston, Texas, branch of Hercules Motors Corp., Canton, Ohio, has moved from 1319 Conti St., to 6818 Navigation Boulevard. Increased space will permit the expansion of branch services and facilities.

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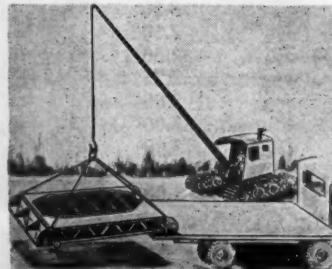
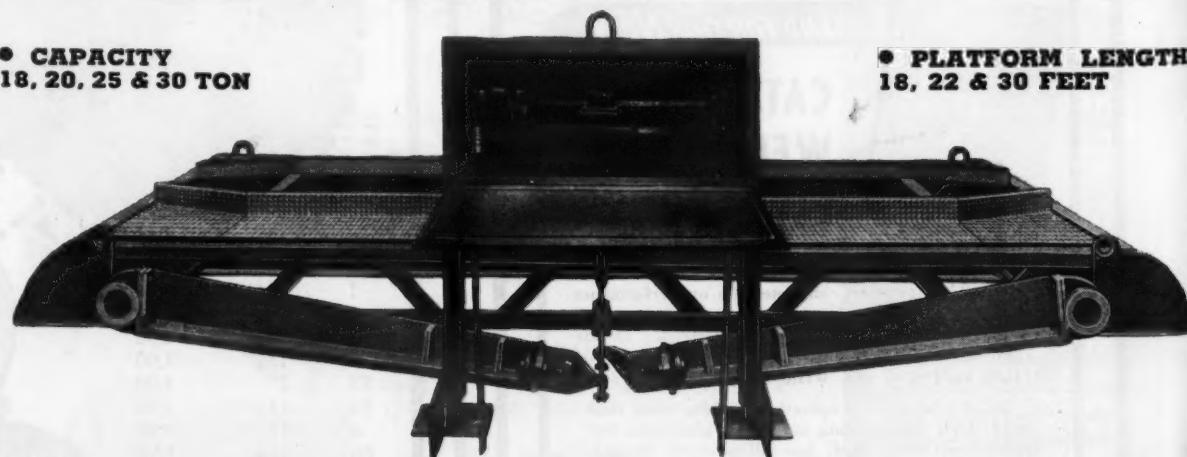
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THE THURMAN PORTABLE TRUCK SCALE can be moved from job to job by removing 6 nuts which hold side arms in place. The rest of the scale can be lifted as a unit. Scale can be moved and readied for use in a few minutes as no adjustments are necessary.

EXTRA LARGE STEEL BASES support the scale, thus requiring no concrete footings. Scale furnished with Chrome-plated weighbeam—other vital parts are electro-plated to prevent rust and corrosion. Immediate Shipment.

Ask for information on other types including wheelbarrow scales, batching scales, and pit-type truck scales.

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The new Safway bosun's chair is useful for repair, maintenance, and inspection on buildings, stacks, tanks, bridges, etc.

New One-Man Hoist For Maintenance Work

Repairs, inspection, and painting of elevated work may easily be made with a new foot-operated bosun's chair, according to Safway Steel Products, Inc., 624 W. State St., Milwaukee 13, Wis. This one-man platform hoist consists of a rigid tubular steel cage which is moved by means of a winch. Sitting on a comfortable bicycle-type adjustable saddle, the worker operates bicycle pedals to raise or lower the hoist. Power is transmitted from the pedal crank to the winch drum by means of a roller chain running on sprocket wheels. Movement of the hoist may be made in either direction.

The new bosun's chair has a rated capacity of 625 pounds. It is furnished complete with 150 feet of $\frac{1}{4}$ -inch 6 x 19 plow-steel wire rope. Weighing 75 pounds, the unit can be rigged by one man. The cable runs over pulleys at the top and back of the unit, arranged so that the cage will always hang in an upright position, with no possibility of tilting, Safway says.

Two hard rubber rollers on the front of the unit prevent marring of working surfaces. The rollers can be tilted to fit cylindrical surfaces found on stacks, tanks, etc. The heavy expanded steel bottom deck permits carrying consider-

able equipment, prevents objects from falling, and allows the worker to stand up if desired.

A sealed lubrication compartment, located on the end of the aluminum winch drum, encloses a planetary gear and brake mechanism. Self-lubrication Oilitc bearings are provided throughout. Three automatic mechanical safety devices, acting independently, assure worker protection.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 154.

Carrying Scraper Now Fully Hydraulic

Now that the rope-actuated latch in the bowl has been replaced with hydraulic operation, control of the Kay-Brunner 1½-yard carrying scraper is fully hydraulic, according to an announcement by Kay-Brunner Steel Products, Inc., Equipment Division, 2721 Elm St., Los Angeles 65, Calif. This improvement permits the bowl to be held in a fixed position so that it can be used for land leveling as well as hauling, scraping, and spreading.

The hydraulic control for this scraper is the single-valve type and can be operated off the same hydraulic unit now being used for other attachments, the company says. Additional features of this scraper include a low center of gravity, balanced weight, even load distribution, an 11-foot turning radius, and easily accessible parts for service and maintenance. Bowl capacities are 1½ yards struck measure, 1½ yards heaped measure.

Further information may be secured by requesting Bulletin 358 ED. Or use the Request Card at page 16. Circle No. 47.

Whiteprinting Unit

The new Pacemaker, a continuous automatic whiteprinting machine manufactured by the C. F. Pease Co., 2601 W. Irving Park Road, Chicago 18, Ill., is designed for printing and developing ammonia-type whiteprints, in cut-sheet form or from rolls, at speeds ranging up to 32 fpm. Accommodating materials up to 42 inches in width and of practically any length, the unit has a push-button master switch which controls all electric motors and heaters, instantly starting or stopping the entire

mechanism.

Features of the Pacemaker include a patented sliding-revolving contact which enables the operator to select either sliding-revolving contact or straight revolving contact; a new type of interlocking roller-developer; positive tracing separation; electronic speed

control; efficient cooling and exhaust system; adjustable automatic ammonia feed control; adjustable print-receiving trays; automatic stacking; and precision construction.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 68.



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● Tears up old asphalt or macadam surfaces and pulverizes into select aggregate for low-cost reuse. Also prepares adobes, clays and other soils for mix-in-place construction. Tractor drawn...self-contained power plant for pulverizing...hydraulic jack depth control...pneumatic tires.

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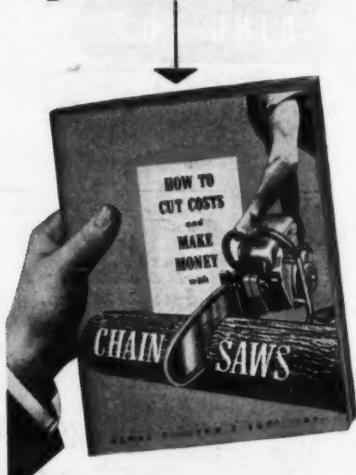
ALL PURPOSE SPREADER CO. Elyria, Ohio
U.S.A.

Machines Help Build Marion, Ohio, Airport

A large new municipal airport is being built near Marion, Ohio, with the cooperation of the Civil Aeronautics Administration, to link this community with large cities throughout the country. Clearing of the 600-acre site began in October, 1948, but actual construction did not get under way until May, 1949. Job schedules called for the completion of runways and taxiways by last November.

W. H. Ringwald & Sons, of Chillicothe, Ohio, built the two runways, each 100 feet wide. The northeast-southwest runway is 4,300 feet long; the northwest-southeast runway is 3,500 feet long. The administration building and terminal, now under construction, will be midway between the two runways. The terminal apron is connected by a wide paved east-west taxiway; this in turn ties in with a north-south paved taxiway 50 feet wide which connects with both runways.

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A Huber heavy-duty motor grader levels runways for the new municipal airport under construction northeast of Marion, Ohio.

Superintendent J. E. Green used four Huber road machines on the job, including a heavy-duty motor grader, a maintainer, and two rollers. The grader leveled macadam on the runways, the rollers were used on stone and blacktop work, and the maintainer served as a grader and bulldozer on fine-grading and filling in drainage ditches.

Streamlined Design For Hose Couplings

The new streamlined design of the high-pressure hose couplings made by Bar-Way Mfg. Co., Stamford, Conn., does away with obstructing projections, sharp edges, and screw clamps. The full inside diameter of the hose is maintained with no reduction of flow, according to the company. Interchangeable and remountable, these couplings have been tested for over 3,000 pounds of pressure, with a pull of over 500 pounds, without failure. Applicable for fire, booster, chemical, and spray hose, these couplings are available for hose with inside diameters of $\frac{1}{2}$, $\frac{3}{4}$, and 1 inch.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 59.

Bulletin on Cylinders For Construction Machinery

A new technical information bulletin, No. CS 248, describes the use of hydraulic actuating cylinders for the removal of mold cores from fresh concrete pipe during production. It is put out by the Ledeen Mfg. Co., 1600 S. San Pedro St., Los Angeles 15, Calif.

and describes the use of Ledeen heavy-duty cylinders for this and other straight-line-motion problems.

Bulletin 500, also issued by the company, is broader in scope. It describes the full line of Ledeen cylinders, pointing out that they may be used in various ways in all kinds of machinery and may be operated by air, oil, water, or steam. They are made in standard diameters and straight lengths, with suitable head and rod attachments to provide any desired mounting and connection to the work or frame structure. Modifications of the standard constructions are available where required, the bulletin explains. Features and complete specifications for the products, both cylinders and attachments, are included in the bulletin. Also given are the ratings, limitations, and suggested methods of selection.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 120.

White Cement Offered

A new white portland cement has recently been introduced to the western market by Calaveras Cement Co., 315 Montgomery St., San Francisco, Calif. The product is described as a nonstaining, waterproof, uniformly white cement. It is designed for use wherever true clear colors are required after the addition of a pigment to the cement; and wherever a bright reflective surface is required for safety, as in marking highway lanes, or for beauty, as in architectural facings. The product is said to meet all Federal government specifications as well as ASTM specifi-

cations for Type 1 portland cement. Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 79.

Low-Temperature Electrodes

Complete data on several new low-temperature welding electrodes are presented in the new 32-page pocket-size catalog offered by All-State Welding Alloys Co., Inc., of 273 Ferris Ave., White Plains, N. Y. The illustrated booklet contains tables of characteristics of All-State rods and fluxes, application information, and helpful hints of general interest.

Among the new products described are a general-purpose steel electrode, a high-alloy-steel electrode, and a phosphor bronze A-electrode for arc welding; a silver-bearing copper-welding alloy for gas welding; and a line of brazing alloys.

This literature may be obtained from the company or by using the Request Card at page 16. Circle No. 135.

New! Low Cost CLAMPS FOR WOOD FORMS



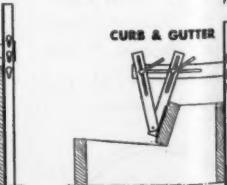
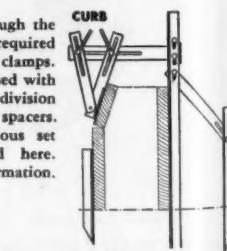
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To save money on form costs write for complete description and prices.

No stakes through the gutter are required with these clamps. They can be used with or without division plates or wood spacers. Note the various set ups illustrated here. Write for information.



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Sickle driven by independent engine gives constant cutting speed regardless of tractor's traveling speed



The new Toro "Roadmaster" cuts weeds, brush and saplings which are impossible to cut with conventional "power take-off" mowers. Its independently powered sickle maintains a constant cutting speed ... shears through growth up to $2\frac{1}{2}$ " ... does a much cleaner job in half the time!

This low-slung tractor sticks on slopes steeper than 35° ... mows over curbs from $1\frac{1}{2}$ " to 10" high... travels up to 48 m.p.h. between jobs. Fast acting hydraulic lift controls sickle at angles from 45° down to 90° up.

For free literature write:

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Distributor Doings

New Site for Maine Truck-Tractor

Maine Truck-Tractor Co., for 20 years a distributor of construction, snow-removal, and logging equipment, has moved to larger quarters at 1079 Forest Ave., Portland, Maine. The company's new building is located on a 50,000-foot lot and provides 2,500 feet of floor space for display, and 6,000 square feet of service facilities including approximately 3,000 feet for the storage of parts.

The firm distributes International wheel and crawler tractors and gasoline and diesel power units; Bucyrus-Erie tractor equipment, shovels, and cranes;



A handsome red-brick building which now houses Maine Truck-Tractor Co. has radiant heating, glass bricked office walls, and a sweeping glass-front showroom.

Adams motor graders; FWD trucks; Hough loaders and sweepers; Frink and Anderson snow plows; Pacific Car & Foundry tractor winches; and American wire rope.

Clarence M. Willey is President of the company, Edward J. Groden is Secretary, William F. O'Connor is Assistant Sales Manager, Charles H. Clough is Office Manager, Dewey L. Robinson is Service Manager, and Murray A. Howard is Parts Department Manager.

Auto-Lite Aids Dealer Service

On-the-spot engineering analysis of application or service problems in connection with spark plugs and other Auto-Lite products is now available to the distributors and dealers of the Electric Auto-Lite Co., Toledo 1, Ohio. The company has appointed five field engineers who will work out of division offices. They will analyze difficulties at the source and advise on any application problems in the field.

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SYNTRON VIBRATING FLOATS

PROFIT-BOOSTING FEATURES
Produce 30% Stronger Concrete
Vibrates stiff dry mix
Five times faster than hand
Eliminates hard work
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Adjustable Power
All-metal construction
No wearing parts
2 models—24" and 30" wide

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SYNTRON CO.
227 Lexington, Homer City, Pa.

These field engineers are: Charles C. Kostan of the Eastern Division with headquarters in New York City; L. P. Atwell, assigned to the Midwest Division with headquarters in Detroit; Kenneth H. Basilius, attached to Central Division headquarters in Chicago; B. S. Fuess, Southern Division office at Dallas; and Raymond W. Heintz, who is with the Western Division with headquarters in Los Angeles.

These men, all graduate engineers, have been further trained for their new jobs by an intensive four-month course at the company's Central Engineering Laboratories in Toledo.



The traveling sales school of Rish Equipment Co., Bluefield, W. Va., is seen here outside the Heil Co. plant in Milwaukee, one of a dozen manufacturers the 63 salesmen visited in the course of a 2,000-mile trip through the middle west.

Executives Sold on Sales Tour

Officials of the Rish Equipment Co., Bluefield, W. Va., are well satisfied with a new wrinkle in their sales training program—instead of an annual sales meeting, a 2,000-mile chartered-bus tour to plants making the equipment Rish sells.

President Lon M. Rish and General Manager H. D. Anderson accompanied their entire sales staff of 63 men on a 12-day cross-country trip in two chartered buses. The places they visited included the motor-grader plant of the J. D. Adams Mfg. Co., Indianapolis, Ind.; the Barber-Greene materials-handling-equipment factory at Aurora, Ill.; International Harvester's sprawling Melrose Park, Ill., tractor plant; and the Frank G. Hough Co. at Libertyville, Ill. Three equipment manufacturers were visited in Milwaukee where the tour ended: The Smith Engineering Works, Harnischfeger Corp., and The Heil Co.

As befits a salesman's expedition, the trip was accompanied by showmanship and fanfare. The Rish men wore dis-

tinctive neckties and badges. At several cities they were met by motorcycle police and escorted to the plant they were to visit, and in a few places mayors presented them with the keys to the city. The caravan distributed gifts from Virginia and West Virginia to city officials and plant executives.

(Continued on next page)

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BITUMINOUS DISTRIBUTOR . . . Streakless application with pressure constantly and automatically maintained.



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ROSCO TAR KETTLE
For heating and melting asphalt, pitch and all types of bituminous materials. Welded all-steel construction.

Keep up your roadsKeep down your costs



BURCH "TILT-LEV"

For spring—for year 'round, in fact—you can't beat this general purpose "Tilt-lev" blade. Blade angle and pressure are controlled from cab by means of four hydraulic cylinders. Auxiliary blade brings in sufficient material to help fill low places.

Tilting feature of both blades gives greater clearance. Attaches to any standard truck—works best on heavy-duty truck.

Write for complete data—folder CE-550

THE BURCH CORPORATION
CRESTLINE, OHIO

Distributor Doings

(Continued from preceding page)

Marion Outlet in Oklahoma

Townsco Equipment Co., 1700-1708 N. W. Sixth Street, Oklahoma City, and 202 S. Lansing, Tulsa, has an exclusive distributorship in Oklahoma for the excavating-equipment line of Marion Power Shovel Co., Marion, Ohio. The Marion line brings the number of major industrial accounts handled by the firm to 13.

Townsco was organized in 1934. G. L. Townsend is President; D. R. Thomas, Vice President; L. Townsend, Secretary-Treasurer; and R. J. McCulloch, Manager of Heavy Equipment. R. K. Auxier is Office Manager at the Oklahoma City office. Manager R. T. Gow and Sales Engineer C. J. White direct activities at the Tulsa branch.

Now Sells Hyster Trucks, Cranes

The Northeast Industrial Equipment Co., Inc., of Cambridge, Mass., is now handling sales and service of Hyster lift trucks, straddle trucks, mobile cranes, and their attachments in Maine, New Hampshire, Rhode Island, and 10 counties of Massachusetts—Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk, and Worcester.

Maurice Hussey is President of the company, John T. Dole is Vice President and General Manager, and Charles Higgins is Treasurer.

O'Mar Moves Up at Larkin

Richard C. O'Mar, who has been with the R. C. Larkin Co., 3001 S. Wabash Ave., Chicago, Ill., for five years as its Sales Representative in the northern Illinois territory, has moved up to become Sales Manager of the Company's Chicago office. Mr. O'Mar worked for Ingersoll-Rand before he joined the Larkin organization.

Mine & Smelter Has New Account

The Mine & Smelter Supply Co., 1422 17th St., Denver, Colo., has been appointed exclusive representative in the Denver and El Paso territory for the air and hydraulic cylinders made by the Hydro-Line Mfg. Co., 711 19th St., Rockford, Ill.



Guests at the formal opening of the Cummins Diesel Sales Corp. plant in Memphis watch staff members demonstrate servicing facilities.

Diesel-Engine Dealer Opens Plant

New dealer and distributor plants are definitely in season. Cummins Diesel Sales Corp. officially opened its new \$100,000 plant at 812 N. Main St., Memphis, last February. Manager J. G. Hull was host at the opening ceremonies to diesel operators in trucking, construction, and earth-moving industries of the area. Of special interest was an activated cutaway version of the Cummins NVHS-1200 engine which develops 550 hp at 2,100 rpm.

Visitors were also interested in the plant's inside truck bays for routine servicing, maintenance department for fuel pumps and injectors, dynamometer for engine tests, machine-shop facilities, and steam-cleaning room. The dealer company maintains branches at Little Rock, Ark., and Knoxville, Tenn.

Coast Equipment Has Joy Account

Coast Equipment Co., 948 Bryant St., San Francisco, is now the exclusive sales and service representative in northern California for Joy Mfg. Co., Pittsburgh, Pa. The Joy line includes the compressors, rock drilling equipment, and core drills formerly sold under the Sullivan trade mark.

Willys Sponsors Dealer Day

More than 2,000 dealers and distributors were present at a recent dealer day sponsored by Willys-Overland Motors, Inc., at Toledo, Ohio. Highlight of the gathering was the unveiling of the 1950 Willys line of passenger cars and trucks. According to the company, the new models represent the first major change in design since shortly after the war when the company intro-

duced its all-steel-body station wagon. The appearance of the new models differs greatly from that of the older ones, but features such as the short hood, short turning radius, and large cargo-carrying space have been retained.

Besides the new-model preview, guests witnessed product and marketing demonstrations, inspected manufacturing facilities, and participated in a mass driveaway of more than 1,500 cars.

Shifts at Anderson Co., Detroit

As of March 1, Harry J. Schultz is General Sales Manager of W. H. Anderson Co., construction-equipment distributor of Detroit. In the course of his career he has been with Dravo-Doyle Construction Co., Equipment Corp. of America, Independent Pneumatic Tool Co., and Worthington Pump & Machinery.

A. C. Hinz, who has been acting as Sales Manager for Anderson for the past year, has returned to his first love—the position of Sales Engineer.

Ziegler Opens New Duluth Plant

Garfield Avenue in Duluth, Minn., now sports a new animated electric-light sign in the evenings—a Caterpillar tractor on the pylon of Wm. H. Ziegler's new building at number 330. The plant's 32,000 square feet of floor space is divided among three departments—shop, office and display and parts. It was occupied last November; a formal opening is to be held this spring.

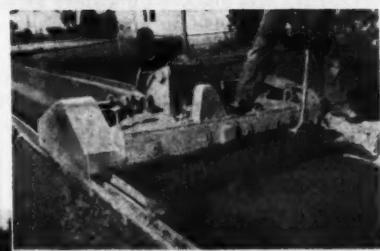
The company's main office is in Minneapolis, and it has another branch office at Crookston. In addition to Caterpillar, it represents a number of other manufacturers.



Bright spot of Garfield Avenue in Duluth is Wm. H. Ziegler's new building with its neon lights and animated electric sign of a Caterpillar tractor.

NOW! PAVE GUTTER, CURB and SIDEWALK INTEGRALLY with the DOTMAR PAVER

AT SPEEDS up to 5' per minute the Dotmar Speedmaster paves curb and gutter or curb, gutter and sidewalk. Simple extensions provide for paving sidewalk up to 60" wide.



Use it too for highway widening and highway dividing curb. Eliminates setting curb face forms. Pays for itself in first mile of paving. Does smooth job. Dozens in use. Qualified distributors in most cities. Send for Catalog 50. Ask for a demonstration.

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Ray Corson Machinery Co.
Denver 9, Colo.
The Corson Company, Inc.
Salt Lake City, Utah
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Los Angeles 22, Calif.
C. H. G. Corp.
Berkeley 10, Calif.
Pecaut Industrial Supply Co.
Sioux Falls, South Dak.
Hawthorne Machinery Co., Inc.
Indianapolis 23, Ind.
Herman M. Brown Co.
Des Moines, Iowa
Tractor & Machinery Co., Inc.
Atlanta, Ga.
Southern Equipment & Tractor Co.
Baton Rouge, La.

Southern Equipment & Tractor Co.
Monroe, La.
Contractors Supply Co.
Bronx 12, N. Y.
Dravo-Boyle Company
Pittsburgh 12, Pa.
Western Construction Equipment Co.
Billings, Montana
North Carolina Equipment Co.
High Point, N. C.
Southern Equipment Sales Company
Columbus, South Carolina
Hampton Roads Tractor & Equipment Co.
Norfolk, Va.
Florida-Georgia Tractor Company
Jacksonville, Florida

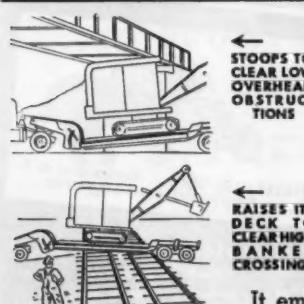
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The ROGERS

4-FEATURE POWER-LIFT DEMOUNTABLE GOOSENECK



It embodies the kind of versatility that makes every haul easier, faster, more profitable.

Loading, at a lower angle, is faster. Larger tires carry heavier loads legally. Unloading, reloading, detouring are avoided through quick adjustment of the deck height to different conditions encountered.

It's equally as rugged as the standard Rogers Gooseneck regardless of its detachable feature. And it's available on most Rogers Trailers and adaptable to many trailers of other makes.

Bring your equipment up-to-date and be in a position to handle operations more efficiently and more profitably.

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ROGERS TRAILERS
EXPERIENCE builds 'em
PERFORMANCE sells 'em
ROGERS BROTHERS CORPORATION, 108 Orchard St., ALBION, PA.



More than 100 years' experience in construction and engineering fields is represented by the management of Sioux Road Equipment, Inc., Sioux Falls, S. Dak. (Left to right) E. I. Larson, Service Manager, H. D. Posey, Sales Manager, C. L. Vader, General Manager, and G. E. Fischer, President.

110 Years in Construction Field

A total of 110 years' experience in the construction and engineering fields backs up the management of Sioux Road Equipment, Inc., 6th St., Sioux Falls, S. Dak. President G. E. Fischer and General Manager C. L. Vader have each spent 30 years in the construction machinery business; and H. D. Posey, Sales Manager, and E. I. Larson, Service Manager, have seen service in the construction and engineering fields for 25 years.

The Sioux Road Equipment Co. was founded in 1945. It is the industrial distributor for Series 71 General Motors diesel engines in South Dakota. Other companies it represents include: Allis-

Chalmers Mfg. Co.; Baker Mfg. Co.; Northwest Engg. Co.; Gar Wood Industries, Inc.; Four Wheel Drive Auto Co.; The Gorman-Rupp Co.; Schield-Bantam Co., Inc.; Diamond Iron Works Inc.; The T. L. Smith Co.; and the Essick Mfg. Co.

Huber Dealers in Pennsylvania

The John Bowman Co., Inc., of Bryn Mawr, Pa., is handling the sale of Huber road equipment to city, county, and township officials in the Pennsylvania counties of Philadelphia, Chester, Montgomery, Bucks, and Delaware. Private contractors and industries in the same counties will be served by American Equipment Corp. of Me-

chanicsburg, Huber distributor for the past several years in 22 other Pennsylvania counties.

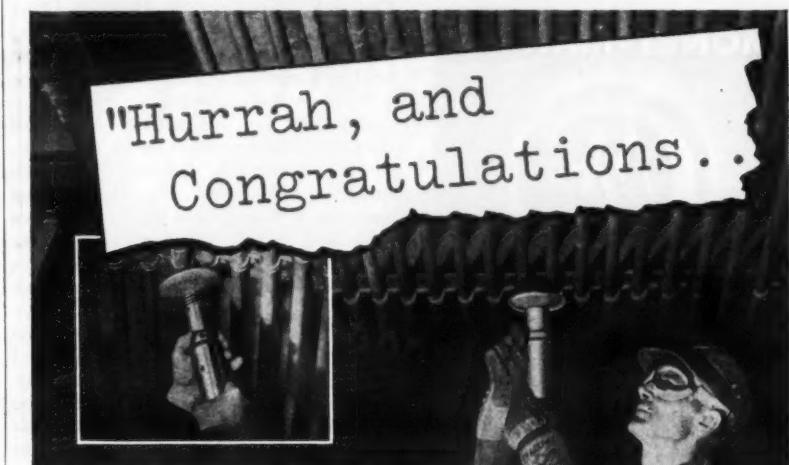
John Bowman, Sr., is President of the Bowman company, Harry A. Weigland is Vice President, John Bowman, Jr., is Secretary, and Mrs. John S. Bowman, Sr., is Treasurer.

School Travels to Distributors

LeTourneau distributors are receiving a big yellow and brown visitor these days—the company's training truck manned by four maintenance experts.

The traveling school is carried in a 33-foot van-type drop-frame trailer

(Concluded on next page)



"Hurrah, and
Congratulations..."

DRIVE-IT
...saved us 85% in fastening costs!"

Users actually bubble over with enthusiasm for the performance of DRIVE-IT powder-actuated fastening tools. One of them started a letter to us the same way we headlined this ad... "Hurrah and congratulations for selling us your DRIVE-IT tool!"

And that letter is no exception. Hundreds of contractors, builders, and sheet metal men praise the efficiency of DRIVE-IT for faster, safer fastening of steel or wood to concrete or steel.

Get the facts on the new DRIVE-IT "300" and you, too, will say "hurrah"!

Distributors Coast to Coast
POWDER POWER TOOL CORPORATION
0705 S. W. Woods St., Portland 1, Oregon
(Canadian Distributor:) Amico Power Tool Co., Ltd.
100 McLean Drive, Vancouver, B. C.

Check these exclusive features of the...

DRIVE-IT 

- Controlled power with one power charge
- Positive, 3-way safety
- Uses flangeless drive-pins
- Permanent, adjustable safety pad
- Semi-silent operation
- Automatic extension barrel

...and remember...
for heavy fastening
Jobs it's the
DRIVE-IT "300"



You bet I'm interested...
Send me the story!

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COMPANY _____

STREET AND NO. _____

CITY AND STATE _____

POWDER-POWER TOOL CORPORATION, 0705 S. W. WOODS STREET, PORTLAND 1, OREGON

Material handling jobs are a cinch... with Fairfield Portable Conveyors

Troughed Belt Conveyors

What have you—Sand? Gravel? Stone? Cement? Cinders? Whatever loose bulk material plays a part in your construction job needs can be handled quickly, efficiently by Fairfield Troughed Belt Conveyors—and save you time and money as well. Yes—brick, tile and other construction materials are handled by this versatile machine! Write for complete information today.

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The second member of a terrific team when materials arrive in railroad cars. The Fairfield Car Unloaders speed the material from the car onto the Troughed Belt Conveyors—eliminate long, expensive loading hours—help you maintain your working schedules. Write for the complete story.

the Fairfield **ENGINEERING** **COMPANY**
348 Chicago Ave., Marion, Ohio

SEND FOR BULLETIN 450

Distributor Doings

(Continued from preceding page)

pulled by a cab-over-engine tractor. Training equipment in the portable classroom includes equipment cutaways, displays, and exhibits, which are set up indoors in distributors' showrooms.

Reynolds Adds Seven Dealers

The Aluminum Division of the Reynolds Metal Co., Louisville, Ky., has recently appointed seven new distributors. Four will handle the general line of Reynolds Aluminum Mill products. They are: Mutual Mfg. & Supply Co., Cincinnati 25, Ohio; American Steel & Alloys Corp., Hartford 5, Conn.; Merchant & Evans Co. and Athos Steel Service Co., both of Philadelphia, Pa.

The three other recently appointed Reynolds distributors will handle pig

and ingot products. They are Silverstein & Pinsoff, Inc., Chicago; Rochester Smelting & Refining Co., Rochester, N.Y.; and The Atlas Metal Co., Cleveland, Ohio.

The addition of these seven brings Reynolds' total list of distributor outlets to 44.

New Kansas Outlet for Willys

The Willys-Overland franchise for 89 of the 105 counties in Kansas has been granted to Earl B. Moon, Wichita. The Moon plant covers 7,000 square feet of floor space and has complete parts and service facilities for both retail and wholesale outlets. Mr. Moon plans to use two of his farms as demonstration plots for the Universal Jeep and its special equipment.

Retractable Wheel For Mobile Equipment

A retractable landing-gear assembly that can easily be attached to all types of two-wheel single-axle trailers has been announced by The United Mfg. Co., 46 W. Interstate St., Bedford, Ohio. The unit provides easy manual moving or positioning of fully loaded units, as well as a rest for unhitched trailers, according to the company.

Designed for use with a variety of portable equipment, such as compressors, generators, pumps, concrete mixers, cable reels, etc., the landing gear has a third wheel which facilitates rapid and easy trailer positioning under a variety of working conditions, says United. When a trailer equipped with one of these units is attached to a towing vehicle, the wheel and fork can be retracted a full 90 degrees and swiveled 90 degrees to clear road obstructions. A snap-action positioning pin locks the gear in either down or retracted position. Overall height of landing gear in down position is 18½ inches.

United's trailer landing-gear units are regularly furnished with 12-inch-diameter 3.50 x 6 pneumatic tires of either 2 or 4-ply construction and with respective load capacities of 315 and 490 pounds. The assemblies can also be equipped with a 4 x 12-inch steel wheel. The fork is a ribbed malleable casting. The integral hub-type wheel and rim is steel and is equipped with Hyatt roller bearings. Three Zerk fittings are provided to make lubrication easier.



Contractor Ray Houck of Dexter, Oreg., uses an Allis-Chalmers AD-4 grader on his job of relocating 4 miles of highway and main-line Southern Pacific track at Eugene, Oreg. The relocation will by-pass Meridian Dam on the Willamette.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 26.

A Safety Drop Hook

A new safety drop hook capable of lifting, hauling, and releasing weights up to 6,000 pounds is now being produced by the Coffing Hoist Co., Danville, Ill. The Coffing safety drop hook is a mechanical type using toggle action. According to the company, these hooks are tested at 100 per cent overload and require only 40 pounds of pull on the release lever to release a 3-ton load. When released, the jaws automatically remain in the open position for reloading. The side plates of the hook are made of special aluminum alloy, and the load-bearing hook, internal cams, and levers are of high-tensile steel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 52.

Permanente Leases in Alaska

Permanente Cement Co., Oakland, Calif., has signed a lease with the Alaska Railroad on a section of waterfront property in Anchorage, Alaska, where it will erect a cement distribution plant to serve the rail-belt area.



*"BOSS"
Self-Honing
Air Valve

As superior in strength and efficiency as in appearance. Quick-acting, self-adjusting, requires no packing. Handle anchored to plug inside the valve body. Maximum flow in open position through streamlined orifice. Sizes: 1/4" to 2".

Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.

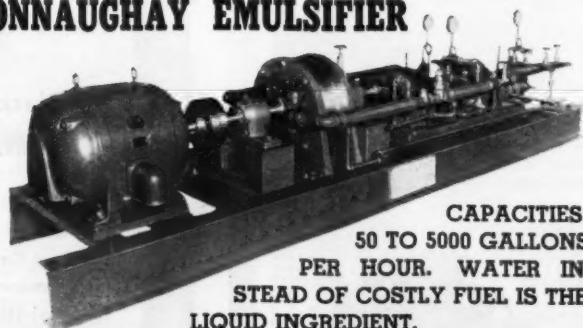
*Reg. U. S. Pat. Off.

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ASPHALT EMULSIONS

Are "Tailormade" to the requirements of each job in this

McCONNAUGHEY EMULSIFIER



CAPACITIES:
50 TO 5000 GALLONS
PER HOUR. WATER IN-
STEAD OF COSTLY FUEL IS THE
LIQUID INGREDIENT.

K. E. McCONNAUGHEY - LAFAYETTE, INDIANA

Now! BUY used equipment
SELL used equipment
ACQUIRE competent personnel

thru
THE TRADING POST, CONTRACTORS & ENGINEERS MONTHLY
470 4th Avenue.
New York 16, N.Y.

Machines Install Large Water Line

Contractor Achieves Complete Mechanization Laying 8 Miles Of Large Concrete Pipe

IN the heart of Los Angeles, a contracting firm which specializes in pipe lines and other heavy construction work is showing city engineers how completely a job of this nature can be mechanized.

Eight miles of precast, prestressed concrete pipe in 54, 60, and 66-inch-diameter sections are being laid from the Baldwin Hills Reservoir toward the residential district at Century Boulevard and Western Avenue. United Concrete Pipe Corp. of Baldwin Park, Calif., is performing the job for the Department of Water and Power of the City of Los Angeles. When it is finished, the new outlet line from Baldwin Hills Reservoir will carry about 150 cfs of pure water for distribution in the southern portion and harbor district of Los Angeles.

At Western Avenue, water in the new line will be distributed in an area which is also served by Metropolitan Water District sources. Thus a marriage of water from two remote sources—the Owens Valley in the High Sierras of California, and the Colorado River—will be effected.

Machines Do the Work

The use of hand labor has been eliminated by United Concrete Pipe Corp. in all major items, and with the exception of a few places where hand labor is absolutely necessary to do fine-grading and the like, the job is dominated by machines. They do the work.

The project is organized to include two complete teams of equipment. Each equipment group has machines to remove the old street pavement, dig the ditch, place the pipe, shovel in the earth backfill, and make the final clean-up. These two groups of equipment are spotted far enough from each other that they do not get in each other's way. When CONTRACTORS AND ENGINEERS MONTHLY visited the site, the two groups were working 2 miles apart.



C. & E. M. Photo
Using a special template, a workman fine-grades the pipe-line ditch. The Parsons trenching machine is in the background.

Only three of United's machines are common to both spreads. Three Caterpillar tractors—a D8, D7, and D6—do bulldozer work in connection with trench backfill at both locations. Pavement breaking is also done by one machine, a truck-mounted RPB heavy-duty breaker which works part time on a rental basis.

The first group consists of a Northwest Pullshovel for broken-pavement removal, a Parsons trenching machine for main trench excavation, a Manitowoc Speedcrane for laying pipe, a Traxcavator for a clean-up and backfill work, and a truck-mounted Lima Paymaster clamshell crane for miscellaneous work wherever it is required. Such uses include confined excavation around intersecting structures, pavement removal, and backfill.

The second equipment group makes use of a P&H truck crane and clamshell bucket for pavement removal, a Parsons trench digger, a Lima laying crane, and a Traxcavator loader.

With the exception of two street intersections which have to be tunneled; one set of railroad tracks which has to be pierced underneath by a heavy liner pipe which will contain the water line; and a 2,500-foot tunnel piercing the crest of the Baldwin Hills, the project is all straight pipe-line work, with the ditch depth ranging from 8 to 18 feet. The new pipe line, passing as it does through a district already well settled, intersects many utilities. These, and the city traffic through the job, are its most difficult problems.

Low-type bituminous surfacing, asphaltic concrete, and portland-cement concrete are involved. The pavement breaking is being done by RPB Corp. of Los Angeles.

Using one of its largest machines, RPB Corp. is staying ahead of the pipe-line crew. The edge of the breaking tool is being used to break a clean cut on both edges of the trench, and the center line is also broken. The three lines of break tear up the old pavement sufficiently that the slab can be broken out the rest of the way by teeth on the loading buckets.

Either a clamshell or a backhoe bucket, depending on the equipment spread, then picks up this broken pavement and loads it out to a fleet of four 12-yard dump trucks. In general, the first 3 feet of trench is also excavated at that time and loaded out. The excavation of this yardage is calculated to take care of excess material which would be left because of the placement of pipe underground.

(Continued on next page)

Pavement Demolition
The major part of the project is located under city streets, and extensive pavement breaking is necessary.

You get more for your money with LaCROSSE

- PROVED...no gadgets!
- Up to 2000 lbs. less dead weight per trailer
- Bigger, more powerful safety brakes
- Up to 45% longer lining life
- Stronger, full length welded frame
- Special wide base rims for longer tire life



Capacities from 8 to 67 tons

LA CROSSE TRAILER CORPORATION, La Crosse, Wis.

Rush complete information on La Crosse trailers:
 Specifications Prices Delivery
 Send name of nearest La Crosse Distributor.
 We may buy a ton trailer about (date)

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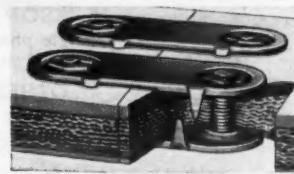
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FASTENERS
and
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FOR HEAVY
CONVEYOR
AND
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BELTS OF
ANY WIDTH



Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-100

FLEXIBLE STEEL LACING CO., 4608 Lexington St., Chicago 44, Ill.

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute strain uniformly.
- ★ Made of Steel, "Monel," "Everdur." Also "Promal" top plates.
- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



C. & E. M. Photo

A Trackson front-end loader helps to get rid of excess dirt removed from the Los Angeles water-line ditch.

Machines Install Large Water Line

(Continued from preceding page)

Broken pavement and excess earth is hauled to a disposal area near Imperial Boulevard and Western Avenue, where it is being used to make a large fill in that area.

Trench Excavation

After the machines have removed the old pavement and excavated the first 3 feet of material, trenching machines then go to work to excavate the ditch to grade. In both set-ups, Parsons trenching machines are used. The machines move along, keeping on line and grade by means of a tight string line previously established by the survey party.

Material which comes out of this excavation is stockpiled off the end of the trenching-machine conveyor line, where it can be used again for backfill. The trenching-machine boom supports the bucket line, which is lowered until the proper grade is reached. One laborer working near the bucket line shovels in any excess material which sometimes is left in a small ridge behind the machine.

One of the most rigidly enforced parts of the plans is connected with this operation. The trench not only has to be cut to careful grade to allow the pipe to rest on the proper slope, but the bottom of the trench has to be trimmed by hand in such a way that the pipe sections have full 90-degree bearing on the soil. This is done by shaping, with shovels, a curved section whose radius is slightly shorter than

that of the pipe. In theory, this permits the weight of the pipe to mash the earth out slightly, giving the pipe barrel full support on compacted ground.

This provision of the plans is being enforced strictly. A crew of about 5 men, working behind the trenching machines, shapes this grade. Special wood templates, curved to the right radius, are drawn along the center line, and the template must fit with little or no tolerance. Each template has a built-in level to keep the curved sides in the right plane, with a center groove through which the center-line string must pass when the templates are used.

The trench excavation crew cuts the ditch so close to grade with the machine boom, however, that the fine-grading can be done without having to bring in or add major amounts of earth.

The pipe line passes through good material, which in general is sufficiently stable to stand up without bracing. Where spots look dangerous, however, trench jacks and 2 x 6 lumber bracing are used.

Cranes Lay Pipe

The 16-foot concrete pipe sections, manufactured in the Baldwin Park yard of United Concrete Pipe Corp., are hauled out to the project by a fleet of company trucks and trailers. Each truck hauls one section, which, with another section on each trailer, makes two pipes per load per machine. The sections weigh from 11 to 14 tons, and are unloaded temporarily to permit the trucks to get out of the way. The pipe sections are then placed in the trench. Cable slings are used, fitted with a

rapid-fastening type of hook which permits the pieces to be picked up without delay.

Chain tongs are used to pull each of the Lock Joint sections together as they are placed. The patented lock joint, with its rubber gasket, is watertight in itself. But after each section is in place, the 1-inch opening on the outside of the pipe is poured full of thin cement mortar, more to rustproof the steel end of the joint than anything else. The inside of the joint is not filled until after the backfill has been placed and all expected settlement of the pipe line has taken place.

Backfill Goes In

Backfilling is done in several lifts. The first layer of earth, pushed in by dozers or clammed in by the Lima Paymaster machine, reaches to the spring line of the pipe. This material is then carefully jetted with water obtained from near-by street hydrants. A long hose and a 7-foot metal jetting pipe

(Continued on next page)



C. & E. M. Photo

A Parsons trenching machine digs the pipe-line ditch on United Concrete Pipe Corp.'s project.

STEP UP YOUR PAVING PROFITS!



JACKSON SIDE FORM VIBRATOR

Eliminates manual vibrating of concrete at side forms. Saves the better part of two men's labor. Mounts on any modern finisher, Jackson Vibratory Paving Tube or spreader. Employs two or more vibratory units that are simultaneously lowered into or raised from the concrete by the finisher operator. Units operate close to forms or reinforcement without fouling — ride over any obstruction encountered. Will not penetrate into sub-base. Assures thorough compaction regardless of speed of finisher or spreader — no spots missed. Long-wearing, trouble-free.*



JACKSON VIBRATORY PAVING TUBE

Quickly makes plastic the stiff, drier concrete mixes which effect up to 10% cement savings. Concrete at forms or joints is, under most conditions, puddled perfectly, thus saving manual vibrating. Reduces spreading cost, steps up finisher progress. Complete compaction, the full width of the slab, and excellent finish is obtained. Perfectly adaptable to slabs 6" to 24" thick and for regular single or two-course construction. Easily adjustable in the field from 10' to 25' slab-widths. Quickly attachable to any standard finisher. Ample power to offset fast drying and setting conditions.*

JACKSON PORTABLE POWER PLANTS generate both single phase and 3-phase 115 volt, 60 cycle AC. Ideal for lights and power tools. Capacities: 1.25 to 5 KVA.

OTHER JACKSON VIBRATORY EQUIPMENT — perfect for every type of concrete placement.

FOR SALE or RENT at your Jackson distributor.* Get your FREE copy of the Jackson "Pocket Guide" showing complete line.

MANUFACTURED BY ELECTRIC TAMPER & EQUIPMENT CO. FOR
JACKSON VIBRATORS, INC., Ludington, Mich.

WELLMAN
Williams Type
Welded Buckets

Operators prefer the Wellman Bucket for its balance, easy handling, and digging power. Owners prefer the Wellman Bucket for its bigger payloads, lower maintenance cost. These features are not accidental. Wellman pioneered in welded construction of rolled steels which make these buckets lighter, stronger, for greater yardage at lower costs. In all types and sizes, you'll do better with a Wellman!

There's a Wellman Bucket for every service

THE WELLMAN ENGINEERING COMPANY
7012 CENTRAL AVENUE CLEVELAND 4, OHIO

are used to distribute water evenly throughout the earth.

Following the first lift of backfill, other lifts are placed generally 5 feet thick. Each lift is jetted and allowed to drain before succeeding earth is put in.

The best of flooded backfill, however, will still settle during the drying-out process. For this reason, specifications provide for a temporary paved surface of bituminous material to protect against mud and dust, which is allowed to remain in place covering the trench area until the backfill is suitable for permanent paving. Traffic during this time helps to develop full compaction over the area. The temporary surface is then scarified, torn up and removed, and the permanent paved surfaces are restored, utilizing the best paving methods, with care being taken to blend the edges in to the line originally broken out when the pavement was demolished for the trench.

With the exception of hand labor used for fine-grading and placing of mortar in the joints, all the operations have been successfully mechanized.

Personnel

The contract is being pushed under the general administration of Samuel B. Morris, General Manager and Chief Engineer of the Department of Water and Power. Laurance E. Goit is Chief Engineer of Water Works and Deputy General Manager, and C. J. Itter was in charge of the pipe-line design. Inspection is under the general direction of Max K. Socha, Engineer of Water Distribution.

Nick Ban, veteran of many a tough pipe-line job including the recent San Diego Aqueduct near Temecula, Calif., is directing field operations for United Concrete Pipe. By June, Nick hopes to have the job finished and ready to sell to the city.

Air-Entraining Cement

A 20-page two-color commemorative booklet entitled "A Decade of Atlas Duraplastic" has recently been issued by the Universal Atlas Cement Co., 723 Chrysler Bldg., New York 17, N. Y. It traces the 1939-1949 period of the origin, development, use, and acceptance of Duraplastic air-entraining cement. With accent on pictorial presentation, the booklet describes how Duraplastic was originally developed to solve the problem of concrete pavement scaling due to the use of de-icing salts,



C. & E. M. Photo

Heavy concrete pipe sections are unloaded beside the trench on the Los Angeles job.

and how other characteristics led to its adaptation in other work.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 82.

Resistivity Device Probes Subsurface

An improved Model LLR earth-resistivity measuring apparatus designed for subsurface exploration has recently been produced by Gico Inc. (Geophysical Instrument Co.) of Arlington, Va. The improved equipment is a modification of the Gish-Rooney apparatus, which the company also manufactures. It is intended for use in obtaining data on subsurface conditions at depths of 300 feet or less.

The Type LLR measures earth resistivity by the Wenner four-electrode method, which by correct interpretation will reveal the character and position of the underlying strata. Potentials are read by a null system, so that no current is drawn from the potential electrodes. This feature is of the greatest importance in precise resistivity work, the company says.

All of the control and measuring elements are mounted upon a panel which serves the double function of providing a mechanically firm support, and of shielding the current and potential circuits from each other. The unit is available in a polished hardwood case with waterproof finish.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 66.

Controls Water Seepage

A new protective coating designed to control water seepage through masonry surfaces—especially white or light-colored ones—has recently been announced by Protection Products Mfg. Co., 1938 Fox St., Kalamazoo 99, Mich. Called Invisible Raincheck, the product is a colorless liquid said not to discolor even after long periods of exposure.

The company states that by retarding the passage of moisture through masonry walls, Invisible Raincheck effectively controls efflorescence or the deposit of alkaline salts on the surface. The product is available in quantities from 1 gallon to 55-gallon drums.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 38.

be controlled and are available for torsional analysis.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 149.

Magnetic Level Frees Hands

A circular describing the Magno-Level, an aluminum-frame level equipped with Alnico magnets, has recently been prepared by The Buckeye Plastic Corp., 1839 Farmington Road, East Cleveland, Ohio. For use by structural workers, plumbers, welders, mechanics, etc., the Magno-Level leaves both hands free for lining up, straightening, or fastening work in place. The literature points out that the clock-face angle gage with a balance gravity-needle indicator will determine any angle from zero to 360 degrees. Specifications and additional applications are listed in the circular.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 34.



Then Compare and See the Difference

TERRAPAC

The Vibro-Plus TERRAPAC Soil-Compactor will give 95% compaction down to a depth of 3½ feet.

The job tested TERRAPAC has proven its value in road work, airports, and back fill compaction.

- Self propelled or tractor drawn
- One man operation
- 2½ gallons of diesel fuel consumption per day

ROLLGEAR "INTERNAL VIBRATOR"

No Other Vibrator But Rollgear Has:

- High frequency (15,000) V.P.M.
- Flexible shaft speed of only 3600 R.P.M.

• A direct snap coupling between engine and shaft. NO TOOLS NEEDED

- 6 month guarantee

TOPDOG "EXTERNAL VIBRATOR"

• Lighter in weight with a heavier kick than ANY OTHER VIBRATOR

- Can save more than 75% of form costs

- 6 month guarantee

• Saving of a bag of cement per cubic yard of concrete

- Besides being used on all types of concrete forms, it can be used on chutes, vibrating tables, etc.



To insure a superior concrete product utilize Vibro-Plus equipment and know-how.

Consult us about your particular problem in vibration. A trained force will be at your disposal to assist you in every way.

DEALERS:

Your inquiries will receive prompt attention.

VIBRO-PLUS PRODUCTS, INC.

54-11 Queens Boulevard
Woodside, L. I. C., N. Y.
HAvemeyer 9-3115

An exclusive feature you will appreciate on MM Industrial Wheelers is shuttle gear performance to streamline loading and dozing operations.

Straight line reverse lever on shuttle gear eliminates slow shifting—the shuttle gear also provides 6 forward and 6 reverse speeds up to 14.5 m.p.h. for saving valuable time on every job.

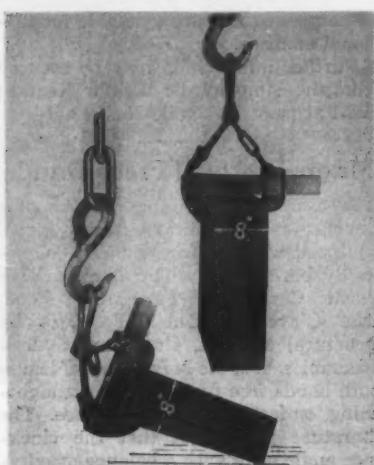
Easiest handling for their capacity, MM Industrial Wheelers are quick and easy to maneuver.

Front wheels are inset over steering knuckle pins to eliminate road shock and binding under heavy front-end load . . . minimize operator fatigue.

To assure low investment on equipment, MM Industrial Wheelers have a wide selection of attachments and a choice of rear wheel equipment that adapt them to many jobs.

Complete facts on Industrial Wheeler application are available at your MM Dealer or from—

MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA



The Merrill Adjusta-Clamp lifts from the horizontal to the vertical without changing its grip.

Adjustable Clamp For Steel Handling

A new material-handling device called the Adjusta-Clamp has recently been introduced by Merrill Bros., 56-02 Arnold Ave., Maspeth P. O., New York, N. Y. The Adjusta-Clamp is said to lift any metal object up to 12 inches thick that its adjustable jaws can grip. If larger openings are required they can be supplied on special order.

The Adjusta-Clamp has all the features of the Merrill Lifting Clamp, plus a movable gripping jaw that can be rapidly set by hand to accommodate the part to be lifted. This device can also lift from a horizontal to a vertical position without changing the grip (see the accompanying illustration). Either a 1-ton or a 3-ton-capacity clamp is available, each with a safety factor of 5 to 1.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 104.

Electrode Designed For Cast-Iron Welds

An improved arc-welding electrode, the W-2075, designed specifically for producing fully machinable welds on cast iron has been announced by General Electric's Apparatus Department, Schenectady 5, N. Y.

The wetting action and ability to be used in all positions on either ac or dc current give great flexibility to the new W-2075 electrode, according to General Electric. It is composed of pure nickel-core wire and an extruded black coating that is consumed in the arc. The stable arc results in weld deposits that are color-matching and of machine-like appearance, and offer increased resistance to cracking, the company says.

The fact that the new W-2075 is designed to operate at low currents minimizes brittle heat-affected zones in base materials. Range of sizes and the welding current required of the W-2075 electrode are from 3/32-inch diameter (50-70 amperes) to 3/16-inch diameter (120-160 amperes). All diameters are supplied in 14-inch lengths.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 92.

Four Masonry Saws

Masonry saws made by the Champion Mfg. Co., 2028 Washington Ave., St. Louis 3, Mo., are available in four models, the R, RK, P, and PK. The K designation indicates that the saw is designed for dry cutting only; the other two models are multiple-duty saws.

Powered by 1 1/2-hp totally enclosed dual-voltage motors, the R Series have a blade capacity up to and including 14 inches; the K series up to and including 18 inches. Standard design gives a cutting depth of 5 and 6 1/2 inches respectively. These saws can be used with Champion Jade or Diamond

blades for wet cutting and Jade blades for dry cutting.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 19.

Bucket Loaders Described

Heavy-duty bucket loaders, Models 80 and 135, are described in a new bulletin issued by the George Haiss Mfg. Co., 141st St. at Park Ave., New York 51, N. Y. Designed for a capacity of 5 and 8 cubic yards per minute respectively, these units may be mounted on wheels or crawlers.

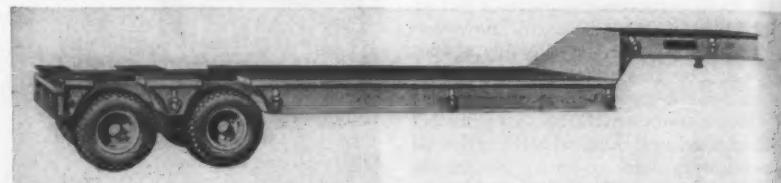
All features, complete specifications, engineering data, and loading costs are included in the folder. On-the-job photographs illustrate applications and engineering drawings indicate the shipping and operating dimensions. Features of principal component parts in operation are also given.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 101.

SOLVE YOUR HAULING PROBLEMS WITH

A "TRANSPORT TRAILER"

Capacities through 75 Ton—Semi and Full Trailers



CARGO CARRIER MODEL GPX (Semi) with Tandem Axles

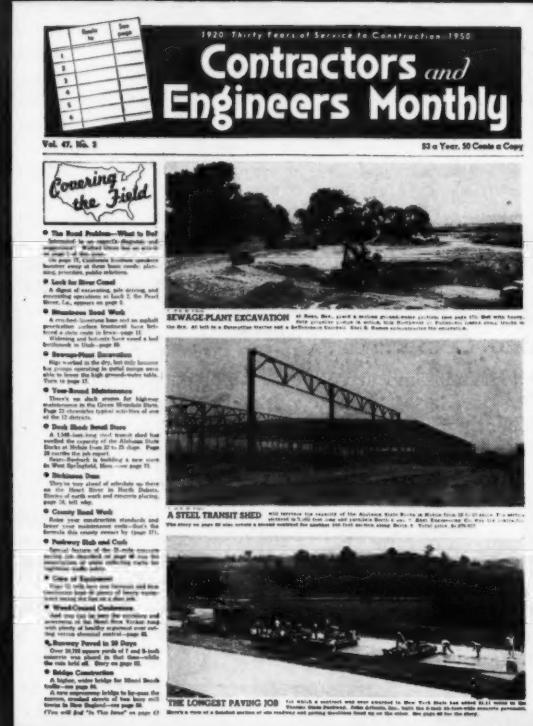
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FRAME—Constructed of beam sections throughout, electric welded. A ruggedly strong and efficient unit with minimum weight.

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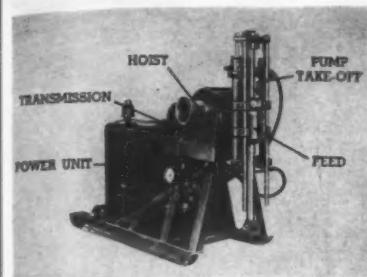
Thirty years ago C&E Monthly pioneered in the presentation of practical, staff-written articles on current construction techniques, the use of equipment and materials right on the job. Our editors spend over two-thirds of their time visiting construction projects, learning first-hand the problems involved on each individual job and taking their own photographs. The resulting news articles, written from

their personal knowledge, are the backbone of C&E Monthly news coverage. Coupled with these project reports, readers of C&E Monthly receive the latest and most thorough coverage of new equipment, new materials, as well as manufacturer and distributor developments.

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The Teredo core drill made by Acker Drill Co. handles depths to 600 feet.

Compact Core Drill

The new Teredo core drill, a high-speed portable drill of medium capacity for depths to 600 feet, has been developed by the Acker Drill Co., Inc., Scranton 3, Pa. Basically, it consists of a combination of 3-speed totally enclosed transmission with either a hydraulic-feed or a screw-feed drill head. The hydraulic feed is said to give the apparatus sensitive and instantaneous control of the rate of advance and the pressure on the bit. On the other hand, the screw-feed drill is lighter in weight and lower in cost, the manufacturer explains.

The 3-speed transmission is designed for proper bit rotation under varying rock conditions. A 24-inch drill travel gives good footage per shift and makes frequent drill-rod changes unnecessary, Acker claims. The gatehead is hinged so that it will swing clear of the hole, making it unnecessary to move the entire drill out of the way when a string of drill rods is being lowered or hoisted. The drill head can be rotated a full 360 degrees to drill holes at any angle. A cathead winch is mounted on the transmission for pulling drill rods and for driving and pulling casings. A power take-off provides for driving an integrally mounted positive-displacement pump; power can be supplied by the plant that best meets the operating and mounting requirements.

Further information may be secured by writing to the company and requesting Bulletin 30. Or use the Request Card at page 16. Circle No. 22.

Film on Safety Glasses

A new safety training film aimed at workers who are skeptical about the value of wearing safety glasses has been announced by the National Safety Council. Through case histories of the injured and through testimony of the blind, the film reminds workers dramatically what their eyes mean to them and how easily eyesight is lost. Then it shows in detail what glasses are best for specific jobs.

"Easy on the Eyes" is available from the National Safety Council, 20 N. Wacker Drive, Chicago 6, Ill., in the usual 35-mm sound slidefilm. It is also offered for 16-mm sound-motion projectors in a new form which combines motion pictures, stills, and unusual optical effects.

Riddell Appointments

A. William McGraw recently moved up to the position of General Sales Manager of the Warco-Hercules Road Machinery Division of the W. A. Riddell Corp., Bucyrus, Ohio. He will have charge of all sales of Warco motor graders and Hercules road rollers.

Robert D. Matthews has been made District Representative in the south-central states of Missouri, Kansas, Oklahoma, Arkansas, Louisiana, and Texas.

Changes for Lincoln Electric

C. L. Stocker has assumed sales and engineering responsibilities for The Lincoln Electric Co. in the San Francisco area, with headquarters at the district office, 1303 Stanford Ave., Emeryville, Calif. He has been District

Manager of the Seattle area since 1943. The welding engineering staff of the Emeryville office has been increased by the addition of M. F. Yale and T. Nichol, recent engineering graduates.

A. L. Patnik has been given responsibility for Lincoln welding engineering in the Seattle, Wash., district office at 1914 Utah Ave. He has been with the company since 1940.

Lubrication System With a Master Oiler

A new master oiler, designed to replace the oil can in industrial lubrication, has recently been developed by Lincoln Engineering Co., 5902-34 Natural Bridge Ave., St. Louis 20, Mo.

This CentrOiler may easily be installed on any machine tool now using the oil can to lubricate a multiplicity of bearing points, the company says. The CentrOiler system enables the machine operator to apply oil, in the desired quantity, to every bearing point. The system consists of a pump supplying lubricant through a single-line circuit of SL-4 injectors which in turn deliver a predetermined quantity of oil to each bearing every time the system is cycled. Features claimed for the system are: reduced oiling time, no downtime for the machine while an oiler gets to inaccessible spots, minimum of oil loss, and no spoilage.

Further information on this lubrication system may be secured from the company. Or use the Request Card at page 16. Circle No. 105.

Care and Maintenance Of Rubber Conveyor Belts

A pocket-size booklet on the installation, care, and maintenance of rubber conveyor belting has recently been issued by Carlyle Rubber Co., Inc., 64 Park Place, New York 7, N. Y. It describes special precautions to eliminate any possible damage to the belting when it arrives at its destination and while it is stored prior to installation. It tells also how to install, splice, and train the conveyor belt.

After installation the life of the belt will depend almost entirely on the care it receives, the company says. The booklet describes proper care and repair.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 124.

Clamshell-Bucket Catalog

A 16-page catalog describing a full line of clamshell buckets has been prepared by Jos. F. Kiesler Co., 928 W. Huron St., Chicago, Ill. These buckets, designed on a 2-lever arm principle—power on both shells—have a grip-

ping action similar to that of ice-tongs. The buckets presented in the booklet include a full line designed for digging and general-purpose work, dredging, rehandling, and timber-log grappling.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 128.



It's here! The new low cost Pressure Distributor—the "Spray King." Once again Littleford is first to offer to Highway Departments and Contractors a low cost unit with features found on most DeLuxe Pressure Distributors.

The "Spray King" has single valve control, a choice of Low Pressure or Torch Type Burners, Full Circulating Vacuum Flow or Standard Suck-Back Spray Bars up to 24 ft. in width. The bars are end-folding or can be non-folding.

Adjustable, manual operated, ground clearance controls for raising and lowering the Spray Bar. Heat Chamber for pump and valves. Filler connection at the rear of the Distributor. These are but a few of the many features of the "Spray King," the new low cost Littleford Pressure Distributor. For further information write for Bulletin Z-14H.

MANUFACTURERS OF

"Spray Master" Pressure Distributors
Highway Brooms
"Kwik-Melter" Roofers Kettles
Tool Heaters
Trail-O-Rollers

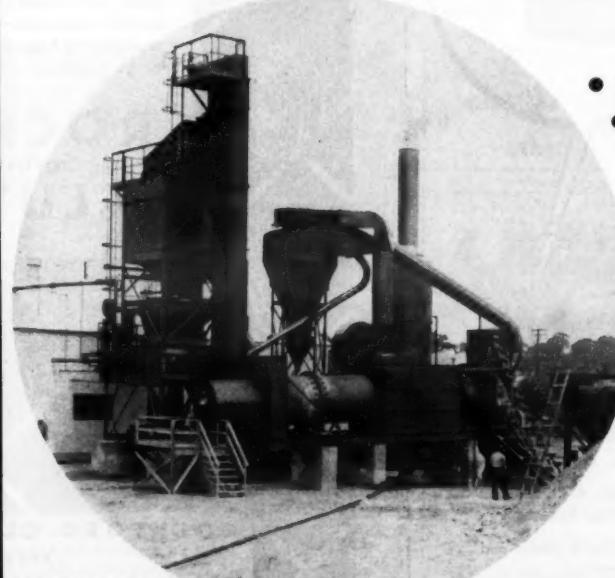
Asphalt Supply Tanks
No. 101 Utility Spray Tanks
84-HD Asphalt Kettles



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CUMMER ASPHALT PLANTS

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- No steam used on plant

Sizes from 25 to 100 Tons (drying and mixing units) available

PROMPT SHIPMENT OF ALL SIZES

Feeders — Storage Bins — Pumps — Timer

Literature on request

THE F. D. CUMMER & SON COMPANY

Builder of fine asphalt plants

Cleveland 15, Ohio

USA



C. & E. M. Photo
Ironworkers rivet the structural steel members of the Des Moines airport terminal building—in the foreground the 3-man driving crew, in the background the blacksmith.

Airport Terminal Gets New Building

(Continued from page 1)

asphalt-tile, or terrazzo, laid on Robertson steel Q-flooring. The offices will have acoustical ceilings and tile floors.

Future development work contemplated at this time will include an extensive concrete parking apron for planes, planted areas, a passenger sidewalk, and a freight loading area.

Major quantities included nearly 9,000 cubic yards of structural excavation, 590 cubic yards of concrete in walls and piers, plus 20,000 square feet of 4-inch concrete flooring in the basement and boiler room. Masonry included 86,500 face brick, and large quantities of Waylite, both common and Flemish bond. The latter material is designed for the passenger waiting room.

Structural Excavation

Material in the excavation area consisted principally of heavy clay. It was moved under a subcontract by Charles Steward, who used a dragline and 6 dump trucks to muck out the main block of material. Two tractor-scrapers were also employed. Since the excavated dirt could all be used either for backfill, or near by, across from the

United Airlines hangar, no long hauls were necessary.

Excavation had not proceeded beyond the basement floor line, however, before two bad springs showed up. The ground water bubbled up, flooding the corners of the site. Sumps were quickly dug, and a 4-inch centrifugal pump went to work. This relieved the situation, but when the boiler room excavation was carried still deeper, the pump had to work continuously until the excavation and concrete work were done. Completion of a big storm drain in that vicinity took much of the ground-water pressure away from the concrete work and eliminated damp subgrade.

Steel Concrete Forms Used

The walls, columns, and other foundation concrete work were formed by Economy patented steel form panels. These are square steel shapes, which when joined together can be made up into practically any wall shape desired. On this project the excavation had been carried back several feet in the clear, so both wall lines were formed by the steel panels.

The panels were usually stripped the day following a pour, cleaned, and moved ahead to be set up for use again.

Concrete in the walls was generally accessible from the natural ground level



C. & E. M. Photos
A Jaeger truck-mixer (top photo) chutes concrete to the basement slab of the Des Moines airport administration building. In next photo concrete finishers handle the initial floating.

outside. Jaeger truck-mixers from Crown Concrete Co. backed in and chuted the material into the wall forms.

Floor slab concrete had to be chuted down to wood runways, where CMC (Concluded on next page, Col. 2)

This Pump is a BIG FEATURE of KINNEY DISTRIBUTORS

The Kinney SD Rotating Plunger Pump brings these 6 big advantages to all Kinney Bituminous Distributors—

1. ACCURACY: The SD pump is accurate as a meter.
2. SIMPLICITY: No valves, springs or gaskets—all passages clear and unrestricted.
3. JACKETED CONSTRUCTION: Pump heated by engine exhaust for quick, easy starting.
4. LARGE CAPACITY: Up to 405 G.P.M. driven by oversize 39 H.P. Hercules engine.
5. DEPENDABILITY: Built for rugged service and long life with minimum maintenance.
6. ACCESSIBILITY: All parts readily accessible for adjustment or repair.

Throughout the world, highway departments and private contractors for forty years have relied on Kinney Distributors for applying oils, tars, asphalts and emulsions. Write for Bulletin A-49: it tells the whole story of Kinney Distributors.



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3531 Washington Street, Boston 30, Mass.

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We also manufacture liquid pumps and vacuum pumps.

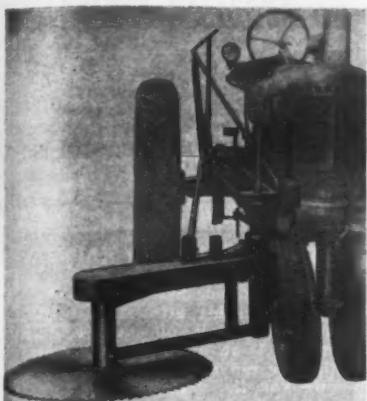
How YOU CAN Get COMPACT Power CONTROL

Save space, in your next product design, by specifying a ROCKFORD engineered-to-the-job clutch—that will fit your power and space needs, exactly. With a wide range of sizes and types to choose from, ROCKFORD engineers are able to recommend a ROCKFORD clutch that will conserve both space and power. Send a blueprint for a specific suggestion—or write for a bulletin covering the type and size clutch best suited for your product.

ROCKFORD Spring Loaded CLUTCHES

ROCKFORD CLUTCH DIVISION
BORG-WARNER
314 Catherine Street, Rockford, Illinois





This new tractor-mounted Kutz-All saw may also be used in a vertical position.

Tractor-Mounted Saw

A new tractor-mounted all-purpose saw designed for felling trees, cutting brush, and sawing wood has recently been offered by the General Farm Equipment Co., 303 E. Seventh, Pittsburgh, Kans. The blade is fully adjustable, is controlled from the tractor seat, and will cut from ground level to 16 inches high while in a horizontal position. The Kutz-All saw may also be operated in a vertical position.

All pulleys and belts on the gate are shielded, and slipping is said to be eliminated by the use of double feed belts equipped with tighteners. Power for operating the saw is transmitted from the rear take-off with the tractor stationary or moving. Blade speed, elevation, and tension are controlled from the tractor seat. The Kutz-All saw is applicable for land-clearing, right-of-way, and roadside-development work.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 126.

Changes at Caterpillar

Frank S. Foster is now Assistant Sales Manager, Western Division, for the Caterpillar Tractor Co., Peoria, Ill. He replaces Truman E. Sage who resigned to join the Northern Commercial Co., Seattle, Wash., Caterpillar distributor for Alaska.

Gordon J. Fowler, formerly District Representative in the San Joaquin Valley, Calif., has become Assistant Sales Manager, Eastern Division, a position which Mr. Foster previously held.

Venn Advances at Willys

Willys-Overland Motors, Inc., Toledo, Ohio, recently made William S. Venn its General Sales Manager. He succeeds Howard O. Lund, who resigned due to an extended illness. Mr. Lund continues with the company on a sick-leave basis.



A Willys Jeep, with a Jeep-a-Trench ditcher made by Auburn Machine Works, Inc., is being used at the Cleveland Municipal Airport to dig more than 20 miles of 3-foot-deep trench for installation of boundary and runway lights. The ditcher is operated from the Jeep's power take-off and can dig 300 feet of trench an hour. When the airport lighting project is completed, the unit will be placed in the field's equipment pool for the numerous small trenching jobs which come up throughout the year.

Airport Terminal Gets New Building

(Continued from preceding page)

concrete buggies picked it up direct from the truck-mixers. The material was dumped on the subgrade on wire reinforcing mesh, which was then raised up by a hook until it lay in the approximate center of the slab.

The floor slab concrete was screeded off by a 2 x 4 float, then bullfloated and edge-finished. Final finishing was done by a Whiteman power finisher. A 10-man concrete crew managed to place all the material very nicely.

No Delay on Steel

Structural steel arrived on time, and it was erected by a Lorain Moto-Crane with a 90-foot boom. The members were bolted temporarily until riveters could finish the job. The structural skeleton went up in a regular pattern, starting at the west end and working east. With the exception of a few small pieces, the Moto-Crane placed all the members.

Installation of the Robertson Q-flooring and much of the masonry was expected to be finished before the autumn rains in late October.

Good organization, a small crew of workmen, and good equipment and materials are playing a big part in Des Moines' new airport building. The work is under the general supervision of Art Thomas, Airport Superintendent for the city, with H. E. Lundberg in charge of contract operations for Garner & Stiles.

Noel Joins Tractomotive

Marshall L. Noel has joined the Tractomotive Corp., Deerfield, Ill., as Vice President and Treasurer. Mr. Noel recently resigned his position as Vice President of Allis-Chalmers Mfg. Co., and General Sales Manager of its Tractor Division.

Cement Floor Topping

An illustrated 8-page catalog describing the Kalman Process for "building in" maximum hardness and density, uniformly, over complete floor areas has been prepared by Kalman Floor Co., Inc., 110 E. 42nd St., New York 17, N. Y. Pictures of the laying of one of these granolithic-cement floor toppings in a typical plant show underslab preparation, preparation of the Kalman topping mix, absorption control, compacting, surfacing, troweling, and curing. Service characteristics of the Kalman topping are fully outlined and a simplified maintenance practice is suggested.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 153.



A Willys Jeep, with a Jeep-a-Trench ditcher made by Auburn Machine Works, Inc., is being used at the Cleveland Municipal Airport to dig more than 20 miles of 3-foot-deep trench for installation of boundary and runway lights. The ditcher is operated from the Jeep's power take-off and can dig 300 feet of trench an hour. When the airport lighting project is completed, the unit will be placed in the field's equipment pool for the numerous small trenching jobs which come up throughout the year.

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Each \$3,750.00
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1-Koehring Bullfloat, 20 to 25 ft. \$2,250.00
2200 L.F. 8" Road Forms
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GMC 2 1/2 ton 6x4 or 6x6 Split Type Axle

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FOR SALE

1—#6 Northwest Combination Crane and Dragline, with shovel boom and dipper stick. Good condition.

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**480 ft.
per day**



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of removing blacktop from existing highways before resurfacing has been introduced to contractors by the Ann Arbor Construction Co. Working on U.S. 112 between Jonesville and Somerset for the Michigan State Highway Department, the contracting firm profitably used a high-speed, rubber-tired C Tournadozer to strip two miles of old, 2 to 4 inch blacktop pavement from a 20-ft. concrete roadbed. Material removed was mechanically sound bituminous concrete which showed no evidence of deterioration.

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Prior to using the Tournadozer on this main Chicago to Detroit highway, Ann Arbor Construction Co. tried removing the hard-packed asphalt by several conventional methods . . . including a backhoe with a grader blade attached to bucket. All proved too slow. The best day's production from any of these rigs was 100 lineal feet.

To boost this low output, Ann Arbor Construction Co. decided to try the power and mobility of a Tournadozer. They drove in a rubber-tired Tournadozer . . . put it to work on a section with grades ranging up to 15% . . . and, despite continuously heavy main-highway traffic and chilly temperatures, found that Tournadozer removed as much as 900 lineal feet of blacktop a day. It averaged 480 lineal feet per day for the entire job! The total cost for the removal of the bituminous concrete surfacing, including loading and hauling

away the refuse, and maintaining traffic during the process, was under \$1.00 per lineal foot of highway or about .47 per sq. yd.

No mechanical trouble

Ann Arbor Construction Co. officials were pleased with the way Tournadozer performed under the steady high-speed pounding required to tear up the tough asphalt. They report no mechanical trouble since they have used the machine.

Check for yourself

Check into this profit-making C Tournadozer for yourself. It's a moneymaker wherever it goes . . . whether you use it for dozing, pulling or push-loading. Call your LeTourneau Distributor or write for the complete story . . . NOW.



LETOURNEAU
EQUIPMENT

Fast speeds both forward and reverse, together with constant-mesh "no-shift" transmission, increase output on shuttle-type operation.

LETOURNEAU
PEORIA, ILLINOIS



TOURNADOZERS

Tournadozer—Trademark Reg. U.S. Pat. Off. R-187-e

IT'S RUBBER THAT PUTS THE ACTION IN TRACTION